

Greater Manchester's Outline Business Case to tackle Nitrogen Dioxide Exceedances at the Roadside

E2 Modelling Report



Salford City Council



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Version Status:	DRAFT FOR APPROVAL	Prepared by:	Transport for Greater Manchester on behalf of the 10 Local Authorities of Greater Manchester
Authorised by: Date:	Simon Warburton 28 th February 2019		

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Version

Conventions

Cells with a red background are **labels or table headings**.

Cells with a yellow background contain **hard-coded input data**

Cells with a white background contain **model calculations**.

Cells with a green background contain reportable **model outputs**.

Cells with a white background are **textual annotations** that are neither headings nor data (e.g. description of a calculation)

Latest Agreed / Circulated Version

Version	Sign-Off Date	Model Responsible Owner	Senior Responsible Owner

Version Control

Version	Based On	Release Date	Lead Analyst	Description of Changes	Impact of Changes	Comments
0.1		26 Feb 2019				

Option 8

Yes
No

Area		2021	2023
Inner Ring Road	IRR		
M60	M60		
Satellite Towns	ST		
Greater Manchester	GM	CAZ B	CAZ C

	2021				2023			
	IRR	M60	ST	GM	IRR	M60	ST	GM
Car Petrol								
Car Diesel								
Taxi				CAZ B				CAZ C
PHV Petrol				CAZ B				CAZ C
PHV Diesel				CAZ B				CAZ C
LGV								CAZ C
HGV				CAZ B				CAZ C
Bus				CAZ B				CAZ C
Coach				CAZ B				CAZ C

Clean Air Fund

	Active
Clean Air Credit Scheme	No
Clean Taxi Fund	No
Clean Freight Fund	No
Clean Bus Technology Fund	No

Annual Parameters	
Year	GDP deflator ¹ (2010 = 100)
1990	62.89
1991	67.02
1992	69.06
1993	70.86
1994	71.72
1995	73.46
1996	76.46
1997	77.17
1998	78.06
1999	78.71
2000	80.32
2001	81.01
2002	82.82
2003	84.81
2004	86.94
2005	89.24
2006	91.94
2007	94.31
2008	96.99
2009	98.45
2010	100.00
2011	102.01
2012	103.60
2013	105.58
2014	107.39
2015	107.88
2016	110.01
2017	112.17
2018	113.88
2019	115.65
2020	117.56
2021	119.57
2022	121.74
2023	124.42
2024	127.16
2025	129.96
2026	132.82
2027	135.74
2028	138.73
2029	141.78
2030	144.90
2031	148.08
2032	151.34
2033	154.67
2034	158.07
2035	161.55
2036	165.11
2037	168.74
2038	172.45
2039	176.24
2040	180.12
2041	184.08
2042	188.13
2043	192.27
2044	196.50
2045	200.83
2046	205.24
2047	209.76
2048	214.37
2049	219.09
2050	223.91
2051	228.84
2052	233.87
2053	239.02
2054	244.28
2055	249.65
2056	255.14
2057	260.75
2058	266.49
2059	272.35
2060	278.35
2061	284.47
2062	290.73
2063	297.12
2064	303.66
2065	310.34
2066	317.17
2067	324.15
2068	331.28
2069	338.57
2070	346.01
2071	353.63
2072	361.41
2073	369.36
2074	377.48
2075	385.79
2076	394.27
2077	402.95
2078	411.81
2079	420.87
2080	430.13
2081	439.60
2082	449.27
2083	459.15
2084	469.25
2085	479.58
2086	490.13
2087	500.91
2088	511.93
2089	523.19
2090	534.70
2091	546.47
2092	558.49
2093	570.77
2094	583.33
2095	596.16
2096	609.28
2097	622.68
2098	636.38
2099	650.38
2100	664.69

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Indexation

			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1																	
2 General Index	Unit	Source															
3 GDP	%	Webtag A5.3.1	97	98	100	102	103	105	107	109	112	114	117	119	122	124	127
4 Inflation	%					1.56%	1.65%	1.71%	1.82%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%
5 Discount Rate	%	Webtag A1.1			0.00%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%
6																	
7																	
8 2018 price																	
9 Deflation	[calc]				1	0.98	0.97	0.95	0.94	0.92	0.90	0.88	0.86	0.84	0.82	0.80	0.79
10 GDP deflator	[calc]	Webtag A1.1			100	102	103	105	107	109	112	114	117	119	122	124	127
11 Discounting Factor	[calc]				1	0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66
12																	
13 2021 price																	
14 Deflation	[calc]							1	0.982	0.961	0.940	0.920	0.900	0.881	0.862	0.843	0.825
15 GDP deflator	[calc]	Webtag A1.1						100	102	104	106	109	111	114	116	119	121
16 Discounting Factor	[calc]							1	0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73
17																	
18 2010 prices																	
19 Inflation																	
20 Deflation	[calc]																
21 GDP deflator	[calc]	Webtag A1.1	110	112	114	116	118	120	122	124	127	130	133	136	139	142	145
22 Discounting Factor	[calc]		0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50

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Depreciation Assumptions	Year																																				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Car	37%	18%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
LGV	37%	18%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
HGV	35%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Bus	35%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Coach	35%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%

Source: JAQU (National data inputs for Local Economic Models.xlsm)

Euro standards implementation	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	1992	1996	2000	2005	2009	2014	2018	2020
Car Diesel	1992	1996	2000	2005	2009	2014	2018	2020
PHV Petrol	1992	1996	2000	2005	2009	2014	2018	2020
PHV Diesel	1992	1996	2000	2005	2009	2014	2018	2020
Taxi Petrol	1992	1996	2000	2005	2009	2014	2018	2020
Taxi Diesel	1992	1996	2000	2005	2009	2014	2018	2020
LGV petrol	1994	1998	2000	2005	2009	2014	2018	2020
LGV diesel	1994	1998	2000	2005	2009	2014	2018	2020
HGV Rigid	1992	1996	2000	2005	2008	2013	2018	2020
HGV Artic	1992	1996	2000	2005	2008	2013	2018	2020
Buses	1992	1996	2000	2005	2008	2013	2018	2020
Coach	1992	1996	2000	2005	2008	2013	2018	2020
Taxi Electric						2013	2018	2020
PHV Electric						2013	2018	2020

Source: JAQU

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TUBA Output

Source: \\EDIFIL01\Data\Environmental\Jobs\Economics\TfGM CAP\O_Project Works\TUBA

Option 8

2010 prices, discounted, £000s

£s, discounted, 2010 prices	Price Year	Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Time benefit	2010	78,975,000	9,197,000	8,794,000	8,423,000	8,074,000	7,748,000	7,602,000	7,466,000	7,340,000	7,222,000	7,109,000
Fuel VOC benefit	2010	5,249,000	585,000	575,000	563,000	552,000	544,000	523,000	504,000	483,000	468,000	452,000
Non-fuel VOC benefit	2010	37,130,000	3,238,000	3,489,000	3,721,000	3,932,000	4,125,000	3,986,000	3,850,000	3,720,000	3,595,000	3,474,000

2010 prices, undiscounted, £000s

Time benefit	2010	134,183,317	13,427,341	13,288,338	13,173,202	13,069,340	12,980,603	13,181,762	13,399,048	13,633,971	13,884,305	14,145,409
Fuel VOC benefit	2010	8,916,037	854,082	868,864	880,507	893,519	911,390	906,875	904,516	897,167	899,731	899,385
Non-fuel VOC benefit	2010	63,649,450	4,727,382	5,272,119	5,819,481	6,364,707	6,910,814	6,911,668	6,909,501	6,909,860	6,911,392	6,912,527

Inflation adjustment 2018 prices, undiscounted, £000s

			1.196	1.217	1.244	1.272	1.300	1.328	1.357	1.387	1.418	1.449
Time benefit	2018	176,901,682	16,054,697	16,177,871	16,390,528	16,619,048	16,869,346	17,507,646	18,187,756	18,913,784	19,684,804	20,496,201
Fuel VOC benefit	2018	11,750,845	1,021,202	1,057,798	1,095,556	1,136,204	1,184,425	1,204,485	1,227,783	1,244,599	1,275,615	1,303,177
Non-fuel VOC benefit	2018	84,345,597	5,652,398	6,418,534	7,240,788	8,093,398	8,981,163	9,179,884	9,378,899	9,585,733	9,798,791	10,016,008

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Additional Measures Input and Assumptions

Clean Air Credits Scheme for cars

Maximum financial incentive offered (£):	3000
Percentage of average car price	24%

Source: Alec Curley, 22/10/2018

Clean Freight Fund scheme for vans, HGVs, minibuses and coaches

Maximum financial incentive offered - Van	3,189
Maximum financial incentive offered - HGV	15,721

Assumption: assume the public sector will subsidise the same percentage of the vehicle value as the percentage of the car subsidy

Clean Taxi Fund

Maximum financial incentive offered (£)	7,500
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Source: <https://tfl.gov.uk/info-for/taxis-and-private-hire/emissions-standards-for-taxis>

Clean Bus Technology Fund

Maximum financial incentive offered - upgrade	38,285
Maximum financial incentive offered - retrofit	4,786

Fuel Switch

Assumed VKMs per vehicle per year		source:
Petrol Car	10,460	DfT, 2017 - https://www.gov.uk/government/statistical-data-sets/nts09-vehicle-mileage-and-occupancy
Diesel Car	16,254	DfT, 2017 - https://www.gov.uk/government/statistical-data-sets/nts09-vehicle-mileage-and-occupancy
Alternative Car	10,460	assumed equal to petrol car
Petrol PHV	40,233	taxi survey 2016 https://www.insuretaxi.com/2016/08/taxi-driver-survey-2016/
Diesel PHV	40,233	taxi survey 2016 https://www.insuretaxi.com/2016/08/taxi-driver-survey-2016/
Alternative PHV	40,233	taxi survey 2016 https://www.insuretaxi.com/2016/08/taxi-driver-survey-2016/
Petrol Taxi	40,233	taxi survey 2016 https://www.insuretaxi.com/2016/08/taxi-driver-survey-2016/
Diesel Taxi	40,233	taxi survey 2016 https://www.insuretaxi.com/2016/08/taxi-driver-survey-2016/
Alternative Taxi	40,233	taxi survey 2016 https://www.insuretaxi.com/2016/08/taxi-driver-survey-2016/
Petrol LGV	20,617	DfT, 2017 - https://www.telegraph.co.uk/connect/small-business/operations-and-logistics/renault/how-many-miles-do-vans-clock-up/
Diesel LGV	20,617	DfT, 2017 - https://www.telegraph.co.uk/connect/small-business/operations-and-logistics/renault/how-many-miles-do-vans-clock-up/
Alternative LGV	20,617	DfT, 2017 - https://www.telegraph.co.uk/connect/small-business/operations-and-logistics/renault/how-many-miles-do-vans-clock-up/
OGV1 (rigid)	28,000	DfT, 2017 road freight statistics table 0112
OGV2 (artic)	77,000	DfT, 2017 road freight statistics table 0113

Table TSGB0303 (ENV0103)

Average new car fuel consumption, Great Britain: 2000 to 2016^{1,2}

		litres per 100 km/miles per gallon																
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Petrol cars	litres per 100km	8.0	7.9	7.8	7.7	7.6	7.5	7.4	7.2	7.0	6.5	6.3	6.1	5.8	5.6	5.5	5.4	5.4
	miles per gallon	35.3	35.8	36.2	36.8	37.0	37.5	38.3	39.0	40.5	43.4	44.6	46.3	48.3	50.1	51.1	52.0	52.2
Diesel cars	litres per 100km	6.3	6.2	6.1	6.2	6.2	6.2	6.3	6.2	5.9	5.7	5.5	5.2	5.0	4.9	4.7	4.6	4.5
	miles per gallon	44.6	45.5	46.0	45.5	45.7	45.4	45.1	45.7	47.7	49.4	51.8	54.4	56.2	58.0	59.9	61.6	62.2

1. These figures are registration weighted (weighted to account for the relative sales of different models of cars).
2. These figures are obtained under consistent, carefully controlled laboratory conditions and do not reflect external factors such as cold starts, differing driving conditions, different loads carried, etc.

Source: DVLA database
Society of Motor Manufacturers and Traders (SMMT)
Defra/DECC's Greenhouse Gas Conversion Factors
Last updated: November 2017
Next update: December 2018
Telephone: 020 7944 6068
E-mail: environment.stats@dft.gsi.gov.uk

Active travel

Cumulative Active travel impact

Type	2021
Walking	1,940,000
Cycling	24,200,000
Total	26,140,000

\\EDIFIL01\Data\Environmental\Jobs\Economics\TfGM CAP\0 Project Works\Economic model\Active travel

Frequency Data

Source: \\EDIFL01\Data\Environmental\Jobs\Economics\TJGM CAP\0_Project Works\Supporting calculations\GM Vehicle Data.xlsx

Below presents the projected ANPR data for the inner ring road for 2021, projected from the base year 2021 raw data

Pre-Euro			1	2	3	4	5	6	7	Grand Total
Veh Type	Fuel	Compliance								
Bus Diesel	Diesel	Non-compliant	0	0	0	0	0	0	0	0
Car Diesel	Diesel	Non-compliant	0	0	0	0	0	0	0	0
Car Electric	Electric	Non-compliant	0	0	0	2	0	0	0	2
Car Other	Other	Non-compliant	5	4	3	0	0	0	0	12
Car Petrol	Petrol	Non-compliant	0	0	0	0	0	0	0	0
HGV Diesel	HGV Diesel	Non-compliant	0	0	0	0	0	0	0	0
PHV Diesel	PHV Diesel	Non-compliant	0	0	0	0	0	0	0	0
Van Diesel	Van Diesel	Non-compliant	0	0	0	0	0	0	0	0
Grand Total			5	4	3	2	0	0	0	14

Euro 1			1	2	3	4	5	6	7	Grand Total
Veh Type	Fuel	Compliance								
Bus Diesel	Diesel	Non-compliant	0	0	0	0	0	0	0	0
Car Diesel	Diesel	Non-compliant	0	0	0	0	0	0	0	0
Car Electric	Electric	Non-compliant	1	1	0	0	0	0	0	2
Car Other	Other	Non-compliant	14	7	2	0	0	0	1	24
Car Petrol	Petrol	Non-compliant	0	0	0	0	0	0	0	0
HGV Diesel	HGV Diesel	Non-compliant	0	0	0	0	0	0	0	0
PHV Diesel	PHV Diesel	Non-compliant	0	0	0	0	0	0	0	0
PHV Petrol	PHV Petrol	Non-compliant	0	0	0	0	0	0	0	0
Van Diesel	Van Diesel	Non-compliant	0	0	0	0	0	0	0	0
Grand Total			15	8	2	0	0	0	1	26

Euro 2			1	2	3	4	5	6	7	Grand Total
Veh Type	Fuel	Compliance								
Bus Diesel	Diesel	Non-compliant	0	0	0	0	0	0	0	0
Car Diesel	Diesel	Non-compliant	0	0	0	0	0	0	0	0
Car Electric	Electric	Non-compliant	2	1	1	0	1	0	0	5
Car Other	Other	Non-compliant	17	4	3	1	2	1	0	28
Car Petrol	Petrol	Non-compliant	0	0	0	0	0	0	0	0
Hackney Diesel	Hackney Diesel	Non-compliant	8	6	0	2	4	0	3	23
HGV Diesel	HGV Diesel	Non-compliant	0	0	0	0	0	0	0	0
PHV Other	PHV Other	Non-compliant	0	0	0	0	0	0	0	0
PHV Diesel	PHV Diesel	Non-compliant	0	0	0	0	0	0	0	0
PHV Petrol	PHV Petrol	Non-compliant	0	0	0	0	0	0	0	0
Van Diesel	Van Diesel	Non-compliant	0	0	0	0	0	0	0	0
Grand Total			27	11	4	3	7	1	3	56

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Euro 3			1	2	3	4	5	6	7	Grand Total
Veh Type	Fuel	Compliance								
Bus Diesel	Bus Diesel	Non-compliant	25	12	9	11	11	2	1	71
Car Diesel	Car Diesel	Non-compliant	1384	469	258	166	152	80	35	2546
Car Electric	Car Electric	Non-compliant	4	2	1	2	2	2	0	13
Car Other	Car Other	Non-compliant	197	59	42	22	28	11	2	361
Car Petrol	Car Petrol	Non-compliant	4933	1750	954	663	624	324	138	9387
Hackney Other	Hackney Other	Non-compliant	14	1	0	0	0	0	0	15
Hackney Diesel	Hackney Diesel	Non-compliant	79	33	28	28	21	27	43	259
HGV Diesel	HGV Diesel	Non-compliant	228	74	42	26	20	5	1	395
PHV Other	PHV Other	Non-compliant	15	2	0	0	0	0	0	17
PHV Diesel	PHV Diesel	Non-compliant	15	10	11	5	3	3	2	48
PHV Other	PHV Other	Non-compliant	4	4	1	1	0	1	0	10
PHV Petrol	PHV Petrol	Non-compliant	6	4	2	1	0	2	0	16
Van Diesel	Van Diesel	Non-compliant	0	0	0	0	0	0	0	0
Grand Total			6904	2420	1348	924	862	457	222	13137

Euro 4			1	2	3	4	5	6	7	Grand Total
Veh Type	Fuel	Compliance								
Bus Diesel	Bus Diesel	Non-compliant	17	9	7	6	10	11	11	71
Car Diesel	Car Diesel	Non-compliant	12058	4350	2279	1591	1454	803	374	22910
Car Electric	Car Electric	Non-compliant	3	2	0	0	2	0	0	7
Car Other	Car Other	Non-compliant	644	233	123	75	84	46	31	1236
Car Petrol	Car Petrol	Compliant	35557	12955	7080	5085	4859	2333	966	68836
Hackney Diesel	Hackney Diesel	Non-compliant	186	83	82	72	79	149	335	986
Hackney Other	Hackney Other	Non-compliant	0	1	0	0	0	0	0	1
Hackney Petrol	Hackney Petrol	Compliant	1	0	0	0	0	0	0	1
HGV Diesel	HGV Diesel	Non-compliant	467	137	78	56	42	10	2	791
PHV Diesel	PHV Diesel	Non-compliant	87	64	59	54	54	54	59	429
PHV Other	PHV Other	Non-compliant	19	16	13	5	5	8	7	73
PHV Petrol	PHV Petrol	Compliant	27	24	15	13	13	13	10	115
Van Diesel	Van Diesel	Non-compliant	5810	2201	1266	799	669	297	97	11139
Grand Total			54877	20074	11002	7756	7270	3724	1892	106595

Euro 5			1	2	3	4	5	6	7	Grand Total
Veh Type	Fuel	Compliance								
Bus Diesel	Bus Diesel	Non-compliant	229	94	48	72	91	133	143	810
Car Diesel	Car Diesel	Non-compliant	39115	14131	7444	5158	4677	2241	1056	73822
Car Electric	Car Electric	Non-compliant	143	57	31	21	16	11	6	285
Car Other	Car Other	Non-compliant	1732	605	346	211	180	98	51	3223
Car Petrol	Car Petrol	Compliant	54986	19999	10628	7956	7839	3599	1375	106382
Hackney Diesel	Hackney Diesel	Non-compliant	69	31	28	36	36	80	192	472
Hackney Other	Hackney Other	Non-compliant	0	0	0	0	0	0	0	0
Hackney Petrol	Hackney Petrol	Compliant	0	2	1	0	1	0	0	4
HGV Diesel	HGV Diesel	Non-compliant	2687	832	406	282	227	74	38	4546
PHV Diesel	PHV Diesel	Non-compliant	150	152	138	164	206	244	329	1384
PHV Electric	PHV Electric	Non-compliant	0	1	0	0	0	0	0	1
PHV Other	PHV Other	Non-compliant	12	13	16	13	21	21	19	113
PHV Petrol	PHV Petrol	Compliant	14	16	27	32	26	25	37	177
Van Diesel	Van Diesel	Non-compliant	9382	3826	2309	1615	1419	576	180	19308
Grand Total			108519	39758	21423	15559	14740	7101	3426	210526

Euro 6

Bus Diesel
 Car Diesel
 Car Electric
 Car Other
 Car Petrol
 Hackney Diesel
 HGV Diesel
 PHV Diesel
 PHV Other
 PHV Petrol
 Van Diesel

Veh Type	Fuel	Compliance	1	2	3	4	5	6	7	Grand Total
Bus	Diesel	Compliant	401	157	131	70	161	196	314	1430
Car	Diesel	Compliant	29424	12844	7773	5616	4691	2263	1029	63640
Car	Electric	Compliant	9077	4715	2711	1768	2593	707	354	21926
Car	Other	Compliant	630	333	188	137	140	60	23	1511
Car	Petrol	Compliant	23871	10524	6340	4529	4758	2233	936	53191
Hackney	Diesel	Compliant	3	1	2	3	7	7	17	40
HGV	Diesel	Compliant	7987	2745	1266	869	721	291	154	14032
PHV	Diesel	Compliant	67	94	111	122	178	205	416	1193
PHV	Other	Compliant	4	4	5	8	9	8	20	56
PHV	Petrol	Compliant	0	89	0	0	0	0	0	89
Van	Diesel	Compliant	4321	2550	1730	1380	1240	510	150	11882
Grand Total			75784	34056	20256	14501	14498	6481	3413	168989

Euro 6c

Car Diesel
 Car Electric
 Car Other
 Car Petrol
 PHV Diesel
 PHV Other
 PHV Petrol

Veh Type	Fuel	Compliance	1	2	3	4	5	6	7	Grand Total
Car	Diesel	Compliant	40017	17467	10571	7637	6379	3078	1400	86550
Car	Electric	Compliant	0	0	0	0	0	0	0	0
Car	Other	Compliant	0	0	0	0	0	0	0	0
Car	Petrol	Compliant	32296	14238	8577	6127	6437	3022	1267	71964
PHV	Diesel	Compliant	91	128	151	166	241	279	566	1622
PHV	Other	Compliant	5	5	7	10	12	10	27	76
PHV	Petrol	Compliant	0	120	0	0	0	0	0	120
Grand Total			72409	31959	19305	13940	13070	6389	3260	160332

Euro 6d

Car Diesel
 Car Electric
 Car Other
 Car Petrol
 PHV Diesel
 PHV Other
 PHV Petrol

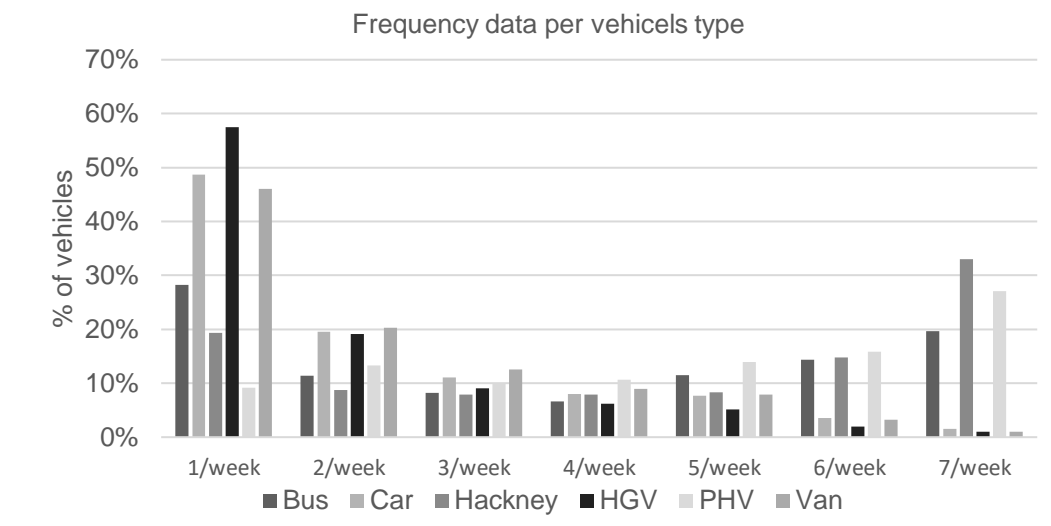
Veh Type	Fuel	Compliance	1	2	3	4	5	6	7	Grand Total
Car	Diesel	Compliant	2354	1027	622	449	375	181	82	5091
Car	Electric	Compliant	0	0	0	0	0	0	0	0
Car	Other	Compliant	0	0	0	0	0	0	0	0
Car	Petrol	Compliant	0	0	0	0	0	0	0	0
PHV	Diesel	Compliant	5	8	9	10	14	16	33	95
PHV	Other	Compliant	0	0	0	0	0	0	0	0
PHV	Petrol	Compliant	0	0	0	0	0	0	0	0
Grand Total			2359	1035	631	459	389	197	116	5187

draft for approval

Veh Type	Fuel	Compliance	1	2	3	4	5	6	7	Grand Total
Bus Diesel	Diesel	Compliant	401	157	131	70	161	196	314	1430
Bus Diesel	Diesel	Non-compliant	271	115	64	88	112	146	156	953
Car Diesel	Diesel	Compliant	124353	50289	28947	20618	17729	8646	3977	254558
Car Diesel	Diesel	Non-compliant	0	0	0	0	0	0	0	0
Car Electric	Electric	Compliant	9230	4778	2744	1793	2614	720	360	22240
Car Electric	Electric	Non-compliant	0	0	0	0	0	0	0	0
Car Other	Other	Compliant	3239	1245	707	446	434	216	108	6395
Car Other	Other	Non-compliant	0	0	0	0	0	0	0	0
Car Petrol	Petrol	Compliant	151644	59466	33579	24360	24518	11511	4682	309760
Car Petrol	Petrol	Non-compliant	0	0	0	0	0	0	0	0
Hackney Diesel	Hackney Diesel	Compliant	3	1	2	3	7	7	17	40
Hackney Diesel	Hackney Diesel	Non-compliant	342	153	138	138	140	256	573	1740
Hackney Other	Hackney Other	Non-compliant	0	0	0	0	0	0	0	0
Hackney Petrol	Hackney Petrol	Compliant	1	2	1	0	1	0	0	5
HGV Diesel	HGV Diesel	Compliant	7987	2745	1266	869	721	291	154	14032
HGV Diesel	HGV Diesel	Non-compliant	3382	1042	526	363	289	88	41	5732
PHV Diesel	PHV Diesel	Compliant	162	230	271	298	433	501	1015	2910
PHV Diesel	PHV Diesel	Non-compliant	252	225	208	223	263	301	390	1861
PHV Electric	PHV Electric	Non-compliant	0	0	0	0	0	0	0	0
PHV Other	PHV Other	Compliant	55	39	40	35	46	47	73	335
PHV Other	PHV Other	Non-compliant	0	0	0	0	0	0	0	0
PHV Petrol	PHV Petrol	Compliant	47	253	45	46	39	40	47	516
PHV Petrol	PHV Petrol	Non-compliant	0	0	0	0	0	0	0	0
Van Diesel	Van Diesel	Compliant	4321	2550	1730	1380	1240	510	150	11882
Van Diesel	Van Diesel	Non-compliant	15192	6027	3575	2414	2088	874	277	30447
Grand Total			320881	129319	73973	53144	50837	24349	12332	664835

	1	2	3	4	5	6	7	Grand Total
Bus	673	272	195	158	274	342	470	2383
Car	288466	115778	65977	47217	45296	21094	9127	592953
Hackney	346	156	141	141	148	263	590	1785
HGV	11369	3787	1792	1233	1010	379	195	19764
PHV	516	747	563	602	781	888	1524	5622
Van	19512	8578	5305	3794	3328	1384	427	42328

	1/week	2/week	3/week	4/week	5/week	6/week	7/week	Grand Total
Bus	28%	11%	8%	7%	11%	14%	20%	100%
Car	49%	20%	11%	8%	8%	4%	2%	100%
Hackney	19%	9%	8%	8%	8%	15%	33%	100%
HGV	58%	19%	9%	6%	5%	2%	1%	100%
PHV	9%	13%	10%	11%	14%	16%	27%	100%
Van	46%	20%	13%	9%	8%	3%	1%	100%



No. of Vehicles by euro standards and vehicle type

2021 Euro Class	Car				Taxi			PHV				LGV			HGV			Bus		
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
0	-	-	-	2	12															
1	-	-	-	2	24															
2	-	-	-	5	28		23													
3	9,387	2,546		13	361		259	15	16		48			17			395			71
4	68,836	22,910		7	1236	1	986	1	115		429			72.82		11139			791	71
5	106,382	73,822		285	3223	4	472	0	177		1,384	1	112.54		19308			4546		810
6	53,191	63,640		21926	1511		40		89		1,193		56.27		11882			14032		1430
6c	71,964	86,550		0	0				120		1,622		76.13							
6d	-	5,091		0	0				-		95		0							
Sub-total	309,760	254,558		22,240	6,395	5	1,780	16	516		4,771	1	335		42,328			19,764		2,383
Total					592,953		Taxi Total 1801				PHV Total 5623				LGV Total 42328.2			HGV Total 19764		Bus Total 2383

Proportion of Vehicles by vehicle type

2021 Euro Class	Car				Taxi			PHV				LGV			HGV			Bus		
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
0	0%	0%	0%	0%	0%															
1	0%	0%	0%	0%	0%				0%		0%									0%
2	0%	0%	0%	0%	0%		1%		0%		0%		0%							0%
3	2%	0%	0%	0%	0%		14%	1%	0%		1%		0%							3%
4	12%	4%	0%	0%	0%		55%	0%	2%		8%		1%							3%
5	18%	12%	0%	1%	0%		26%	0%	3%		25%	0%	2%							34%
6	9%	11%	4%	0%	0%		2%		2%		21%		1%							60%
6c	12%	15%	0%	0%	0%				2%		29%		1%							
6d	0%	1%	0%	0%	0%				0%		2%		0%							
Sub-total	52%	43%		4%	1%	0%	99%	1%	9%		85%	0%	6%		100%		0%	100%		100%
Total					100%		Taxi Total 100%				PHV Total 100%				LGV Total 100%			HGV Total 100%		Bus Total 100%

Expansion Factors

AADT/AAWT Road Traffic Annualisation Factors (Air Quality - 24 hour Period)						
Hour to Period Factors						
	Motorways			Other Roads		
	AM Peak Hour to AM Peak Period	Inter-Peak Hour to Off-Peak Period	PM Peak Hour to PM Peak Period	AM Peak Hour to AM Peak Period	Inter-Peak Hour to Off-Peak Period	PM Peak Hour to PM Peak Period
Cars/Motorcycles	2.871	9.944	2.862	2.693	9.649	2.807
LGVS	3.117	9.944	3.116	3.125	9.649	3.071
Rigid HGVS	3.055	9.944	3.1	3.04	9.649	3.472
Articulated HGVS	3.167	9.944	3.044	3.018	9.649	3.049
Buses	3.648	9.944	3.15	2.941	9.649	3.098

Source:
<\\EDIFIL01\Data\Environmental\Jobs\Economics\TfGM CAP\0 Project Works\Data and Downloads\2019-01-28 From Adam James>

Notes:
 AM peak period = 0700-1000
 PM peak period = 1600-1900
 Off-peak period = 0000-0700 + 1000-1600 + 1900-2400

The off-peak period to weekend factors convert weekday off-peak period flows to all day Saturday/Sunday/Bank Holiday flows. (Bank holiday flows are assumed to be similar to Sunday flows).

Behavioural Response Analysis

Behavioural Response (trips)

Response	Car	Taxis	PHVs	LGVs	HGVs	Buses/Coaches
Pay Charge	0.00%	0.00%	30.20%	9.60%	9.40%	0%
Change Mode	0.00%	0.00%	0.00%	7.50%	0.00%	0%
Cancel Trip	0.00%	0.00%	0.00%	7.50%	4.20%	0%
Upgrade Vehicle	0.00%	100.00%	69.80%	75.40%	86.50%	100%

Source: Behavioural Response (Adam James-Jon Addy, Jacobs)

Car Response to charging

Charge Level	£3.00	£3.50	£4.00	£4.50	£5.00	£5.50	£6.00	£6.50	£7.00	£7.50	£8.00	£8.50	£9.00	£9.50	£10.00	£10.50	£11.00	£11.50	£12.00	£12.50	
Pay Charge	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Change Mode	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cancel Trip	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Upgrade Vehicle	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Private Hire taxi response to charging

Charge Level	£3.00	£3.50	£4.00	£4.50	£5.00	£5.50	£6.00	£6.50	£7.00	£7.50	£8.00	£8.50	£9.00	£9.50	£10.00	£10.50	£11.00	£11.50	£12.00	£12.50
Pay Charge	53.70%	51.30%	48.70%	46.10%	43.50%	40.80%	38.10%	35.40%	32.80%	30.20%	27.60%	25.20%	22.80%	20.50%	18.40%	16.40%	14.50%	12.80%	11.20%	9.80%
Change Mode	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cancel Trip	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Upgrade Vehicle	46.30%	48.80%	51.30%	53.90%	56.50%	59.20%	61.90%	64.60%	67.20%	69.80%	72.40%	74.80%	77.20%	79.50%	81.60%	83.60%	85.50%	87.20%	88.80%	90.20%

LGV response to charging:

Charge Level	£3.00	£3.50	£4.00	£4.50	£5.00	£5.50	£6.00	£6.50	£7.00	£7.50	£8.00	£8.50	£9.00	£9.50	£10.00	£10.50	£11.00	£11.50	£12.00	£12.50
Pay Charge	24.50%	22.50%	20.60%	18.80%	17.00%	15.30%	13.70%	12.30%	10.90%	9.60%	8.50%	7.40%	6.50%	5.60%	4.90%	4.20%	3.60%	3.10%	2.60%	2.20%
Change Mode	4.40%	4.80%	5.10%	5.50%	5.90%	6.20%	6.60%	6.90%	7.20%	7.50%	7.80%	8.10%	8.30%	8.50%	8.60%	8.80%	8.90%	9.00%	9.00%	9.00%
Cancel Trip	5.10%	5.50%	5.80%	6.10%	6.40%	6.60%	6.90%	7.10%	7.30%	7.50%	7.60%	7.70%	7.80%	7.80%	7.80%	7.80%	7.70%	7.60%	7.50%	7.40%
Upgrade Vehicle	66.00%	67.20%	68.50%	69.60%	70.70%	71.80%	72.80%	73.70%	74.60%	75.40%	76.10%	76.80%	77.50%	78.10%	78.70%	79.20%	79.80%	80.30%	80.80%	81.30%

HGV response to charging

Response	HGV
Pay Charge	9.4%
Change Mode	0.0% Avoid
Cancel Trip	4.2%
Upgrade Vehicle	86.5%

Hackney cab response to charging

Upgrade Vehicle	100%
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Buses/Coaches

Upgrade	100%
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Charges and Penalties

This worksheet presents the charge level assumptions used.

CHARGES ASSUMPTIONS

Charging Levels (£s, 2021 prices)

Vehicle	Low	Medium	High
Car Petrol	5	7.5	10
Car Diesel	5	7.5	10
PHV Petrol	5	7.5	10
PHV Diesel	5	7.5	10
Taxi Petrol	5	7.5	10
Taxi Diesel	5	7.5	10
LGV petrol	5	7.5	10
LGV diesel	5	7.5	10
HGV	100	100	100
HGV	100	100	100
Bus	100	100	100
Coach	100	100	100

Source: GM CAZ Charges Analysis v1.1.docx, Jacobs

No. of Unique Vehicles

This worksheet presents the number of unique vehicles in GM

Growth factor of car ownership (2016-2021)	1.0533	source: TEMPro
Growth factor of car ownership (2018-2021)	1.0313	source: TEMPro

Total Number of Unique Vehicles

	Year	Base	2021	ANPR	ratio	Source:
Cars	2016	1,139,980	1,200,741	592,953	2.03	DVLA
LGV	2016	111,872	117,835	42,328	2.78	DVLA
HGV	2016	30,525	32,152	19,764	1.63	DVLA
bus	2016	2,739	2,885	2,383	1.21	DVLA
Taxi	2018	2135	2,202			DfT statistics, Table TAXI0104 "Taxis, Private Hire Vehicles (PHVs) and their drivers: England and Wales by licensing area"
PHV	2018	11681	12,047			DfT statistics, Table TAXI0104 "Taxis, Private Hire Vehicles (PHVs) and their drivers: England and Wales by licensing area"

Note: as we are using the number of unique vehicles registered in GM, we will not be able to account for the vehicles which are not registered outside of GM

Car		Taxi			PHV				LGV			HGV			Bus		
Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
CarElectric	DCar	HackneyP	HackneyD	HackneyO	PCar	DCar	PHVElectr	PHVOther	VanPetrol	DVan	VanOther	HGVPetrol	DHGV	HGVOther	BusPetrol	DBus	BusOther
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0%	1%	0%	0%	0%	4%	1%	0%	0%	0%	1%	0%	0%	1%	0%	0%	1%	0%
0%	11%	0%	0%	0%	23%	11%	0%	0%	0%	16%	0%	0%	6%	0%	0%	5%	0%
0%	15%	0%	0%	0%	19%	15%	0%	0%	0%	10%	0%	0%	93%	0%	0%	94%	0%
0%	21%	0%	0%	0%	54%	21%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	0%
0%	52%	0%	0%	0%	0%	52%	0%	0%	0%	56%	0%	0%	0%	0%	0%	0%	0%
0%	100%	0%	0%	0%	100%	100%	0%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%

2027		Car				Taxi			PHV				LGV			HGV			Bus		
Euro Class	Euro Class	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
		PCar	DCar	CarElectric	DCar	HackneyP	HackneyD	HackneyO	PCar	DCar	PHVElectr	PHVOther	VanPetrol	DVan	VanOther	HGVPetrol	DHGV	HGVOther	BusPetrol	DBus	BusOther
Pre-Euro	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Euro 1	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Euro 2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Euro 3	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Euro 4	4	2%	1%	0%	1%	0%	0%	0%	2%	1%	0%	0%	0%	1%	0%	0%	1%	0%	0%	1%	0%
Euro 5	5	15%	7%	0%	7%	0%	0%	0%	15%	7%	0%	0%	0%	10%	0%	0%	4%	0%	0%	3%	0%
Euro 6	6	17%	11%	0%	11%	0%	0%	0%	17%	11%	0%	0%	0%	8%	0%	0%	95%	0%	0%	96%	0%
Euro 6c	6c	64%	18%	0%	18%	0%	0%	0%	64%	18%	0%	0%	0%	16%	0%	0%	0%	0%	0%	0%	0%
Euro 6d	6d	0%	63%	0%	63%	0%	0%	0%	0%	63%	0%	0%	0%	65%	0%	0%	0%	0%	0%	0%	0%
Sub-total		100%	100%	0%	100%	0%	0%	0%	100%	100%	0%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%

Euro Class
Pre-Euro
Euro 1
Euro 2
Euro 3
Euro 4
Euro 5
Euro 6
Euro 6c
Euro 6d
Sub-

Car		Taxi			PHV				LGV			HGV			Bus		
Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
CarElectric	DCar	HackneyP	HackneyD	HackneyO	PCar	DCar	PHVElectr	PHVOther	VanPetrol	DVan	VanOther	HGVPetrol	DHGV	HGVOther	BusPetrol	DBus	BusOther
0	0	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0
0	70	0	0	0	43	70	0	0	0	15	0	0	28	0	0	93	0
0	9	0	0	0	23	9	0	0	0	4	0	0	13	0	0	3	0
0	33	0	0	0	20	33	0	0	0	68	0	0	19	0	0	10	0
0	16	0	0	0	16	16	0	0	0	8	0	0	27	0	0	31	0
0	37	0	0	0	67	37	0	0	0	60	0	0	26	0	0	14	0
0	60	0	0	0	111	60	0	0	0	61	0	0	130	0	0	157	0
0	60	0	0	0	232	60	0	0	0	43	0	0	0	0	0	0	0
0	2685	0	0	0	0	2685	0	0	0	2635	0	0	0	0	0	0	0
compliant	0%	non-compliant	27%	non-compliant	27%	non-compliant	32%	non-compliant	19%	non-compliant	25%						

2027		Car				Taxi			PHV				LGV			HGV			Bus		
Euro Class	Euro Class	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
		PCar	DCar	CarElectric	DCar	HackneyP	HackneyD	HackneyO	PCar	DCar	PHVElectr	PHVOther	VanPetrol	DVan	VanOther	HGVPetrol	DHGV	HGVOther	BusPetrol	DBus	BusOther
Pre-Euro	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0
Euro 1	1	26	42	0	42	0	0	0	26	42	0	0	0	9	0	0	17	0	0	56	0
Euro 2	2	17	7	0	7	0	0	0	17	7	0	0	0	5	0	0	10	0	0	3	0
Euro 3	3	14	21	0	21	0	0	0	14	21	0	0	0	42	0	0	12	0	0	6	0
Euro 4	4	11	12	0	12	0	0	0	11	12	0	0	0	6	0	0	19	0	0	19	0
Euro 5	5	46	25	0	25	0	0	0	46	25	0	0	0	38	0	0	18	0	0	10	0
Euro 6	6	100	44	0	44	0	0	0	100	44	0	0	0	50	0	0	134	0	0	160	0
Euro 6c	6c	278	52	0	52	0	0	0	278	52	0	0	0	40	0	0	0	0	0	0	0
Euro 6d	6d	0	3261	0	3261	0	0	0	0	3261	0	0	0	3071	0	0	0	0	0	0	0
		non-compliant	0%	non-compliant	18%	non-compliant	18%	non-compliant	20%	non-compliant	13%	non-compliant	16%								

Euro Class
Pre-Euro
Euro 1
Euro 2
Euro 3
Euro 4
Euro 5
Euro 6
Euro 6c
Euro 6d

2028		Car				Taxi			PHV				LGV			HGV			Bus		
Euro Class	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
	PCar	DCar	CarElectric	DCar	HackneyP	HackneyD	HackneyO	PCar	DCar	PHVElectr	PHVOther	VanPetrol	DVan	VanOther	HGVPetrol	DHGV	HGVOther	BusPetrol	DBus	BusOther	
0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4	1%	1%	0%	1%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5	9%	4%	0%	4%	0%	0%	0%	9%	4%	0%	0%	0%	5%	0%	0%	2%	0%	0%	2%	0%	0%
6	15%	7%	0%	7%	0%	0%	0%	15%	7%	0%	0%	0%	6%	0%	0%	97%	0%	0%	97%	0%	0%
6c	74%	15%	0%	15%	0%	0%	0%	74%	15%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%
6d	0%	73%	0%	73%	0%	0%	0%	0%	73%	0%	0%	0%	73%	0%	0%	0%	0%	0%	0%	0%	0%
total	100%	100%	0%	100%	0%	0%	0%	100%	100%	0%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%

2028		Car				Taxi			PHV				LGV			HGV			Bus			
Euro Class	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other		
	PCar	DCar	CarElectric	DCar	HackneyP	HackneyD	HackneyO	PCar	DCar	PHVElectr	PHVOther	VanPetrol	DVan	VanOther	HGVPetrol	DHGV	HGVOther	BusPetrol	DBus	BusOther		
0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	
1	10	17	0	17	0	0	0	10	17	0	0	0	4	0	0	7	0	0	22	0	0	
2	11	6	0	6	0	0	0	11	6	0	0	0	5	0	0	6	0	0	3	0	0	
3	8	10	0	10	0	0	0	8	10	0	0	0	19	0	0	7	0	0	3	0	0	
4	6	8	0	8	0	0	0	6	8	0	0	0	3	0	0	11	0	0	9	0	0	
5	26	13	0	13	0	0	0	26	13	0	0	0	19	0	0	11	0	0	6	0	0	
6	89	29	0	29	0	0	0	89	29	0	0	0	40	0	0	136	0	0	163	0	0	
6c	320	44	0	44	0	0	0	320	44	0	0	0	37	0	0	0	0	0	0	0	0	
6d	0	3779	0	3779	0	0	0	0	3779	0	0	0	3463	0	0	0	0	0	0	0	0	
			non-compliant	0%	non-compliant	9%				non-compliant	9%			non-compliant	10%			non-compliant	7%		non-compliant	7%

2029		Car				Taxi			PHV				LGV			HGV			Bus		
Euro Class	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
	PCar	DCar	CarElectric	DCar	HackneyP	HackneyD	HackneyO	PCar	DCar	PHVElectr	PHVOther	VanPetrol	DVan	VanOther	HGVPetrol	DHGV	HGVOther	BusPetrol	DBus	BusOther	
Pre-Euro	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Euro 1	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Euro 2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Euro 3	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Euro 4	4	1%	1%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Euro 5	5	5%	2%	0%	2%	0%	0%	5%	2%	0%	0%	0%	2%	0%	0%	0%	2%	0%	0%	2%	0%
Euro 6	6	14%	5%	0%	5%	0%	0%	14%	5%	0%	0%	0%	6%	0%	0%	98%	0%	0%	98%	0%	0%
Euro 6c	6c	79%	14%	0%	14%	0%	0%	79%	14%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%
Euro 6d	6d	0%	78%	0%	78%	0%	0%	0%	78%	0%	0%	0%	78%	0%	0%	0%	0%	0%	0%	0%	0%
Sub-total	100%	100%	0%	100%	0%	0%	0%	100%	100%	0%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%

2029		Car				Taxi			PHV				LGV			HGV			Bus			
Euro Class	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other		
	PCar	DCar	CarElectric	DCar	HackneyP	HackneyD	HackneyO	PCar	DCar	PHVElectr	PHVOther	VanPetrol	DVan	VanOther	HGVPetrol	DHGV	HGVOther	BusPetrol	DBus	BusOther		
Pre-Euro	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	
Euro 1	1	2	3	0	3	0	0	2	3	0	0	0	1	0	0	1	0	0	4	0	0	
Euro 2	2	8	5	0	5	0	0	8	5	0	0	0	6	0	0	5	0	0	3	0	0	
Euro 3	3	5	4	0	4	0	0	5	4	0	0	0	7	0	0	4	0	0	1	0	0	
Euro 4	4	4	6	0	6	0	0	4	6	0	0	0	2	0	0	7	0	0	3	0	0	
Euro 5	5	16	7	0	7	0	0	16	7	0	0	0	8	0	0	7	0	0	5	0	0	
Euro 6	6	84	22	0	22	0	0	84	22	0	0	0	35	0	0	138	0	0	164	0	0	
Euro 6c	6c	343	40	0	40	0	0	343	40	0	0	0	36	0	0	0	0	0	0	0	0	
Euro 6d	6d	0	4055	0	4055	0	0	0	4055	0	0	0	3672	0	0	0	0	0	0	0	0	
			non-compliant	0%	non-compliant	4%				non-compliant	4%			non-compliant	4%			non-compliant	4%		non-compliant	4%



		Car				Taxi			PHV				LGV			HGV			Bus		
2030		Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
Euro Class	Euro Class	PCar	DCar	CarElectric	DCar	HackneyP	HackneyD	HackneyO	PCar	DCar	PHVElectr	PHVOther	VanPetrol	DVan	VanOther	HGVPetrol	DHGV	HGVOther	BusPetrol	DBus	BusOther
Other																					
BusOther																					
0%	Pre-Euro	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0%	Euro 1	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0%	Euro 2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0%	Euro 3	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0%	Euro 4	4	1%	1%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0%	Euro 5	5	4%	2%	0%	2%	0%	0%	4%	2%	0%	0%	2%	1%	0%	0%	1%	0%	0%	1%	0%
0%	Euro 6	6	14%	5%	0%	5%	0%	0%	14%	5%	0%	0%	0%	5%	0%	0%	98%	0%	0%	99%	0%
0%	Euro 6c	6c	81%	13%	0%	13%	0%	0%	81%	13%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	0%
0%	Euro 6d	6d	0%	80%	0%	80%	0%	0%	0%	80%	0%	0%	0%	79%	0%	0%	0%	0%	0%	0%	0%
0%	Sub-total		100%	100%	0%	100%	0%	0%	100%	100%	0%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%

		Car				Taxi			PHV				LGV			HGV			Bus		
2030		Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
Euro Class	Euro Class	PCar	DCar	CarElectric	DCar	HackneyP	HackneyD	HackneyO	PCar	DCar	PHVElectr	PHVOther	VanPetrol	DVan	VanOther	HGVPetrol	DHGV	HGVOther	BusPetrol	DBus	BusOther
Other																					
BusOther																					
0	Pre-Euro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	Euro 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	Euro 2	2	8	5	0	5	0	0	8	5	0	0	0	6	0	0	4	0	0	3	0
0	Euro 3	3	4	3	0	3	0	0	4	3	0	0	0	4	0	0	3	0	0	0	0
0	Euro 4	4	3	6	0	6	0	0	3	6	0	0	0	2	0	0	6	0	0	2	0
0	Euro 5	5	13	6	0	6	0	0	13	6	0	0	0	6	0	0	6	0	0	4	0
0	Euro 6	6	82	20	0	20	0	0	82	20	0	0	0	33	0	0	138	0	0	164	0
0	Euro 6c	6c	348	39	0	39	0	0	348	39	0	0	0	35	0	0	0	0	0	0	0
0	Euro 6d	6d	0	4124	0	4124	0	0	0	4124	0	0	0	3724	0	0	0	0	0	0	0
3%			non-compliant	0%		non-compliant	3%		non-compliant	3%			non-compliant	3%		non-compliant	3%		non-compliant	2%	

Vehicle Upgrade Assumptions

Upgrade Response

Response	Assumption	Explanation
Scrap	25.00%	A proportion, 25%, of those people taking the upgrade response will scrap their old vehicle
Buy new	25.00%	A proportion, 25%, of those people choosing to upgrade will buy a new vehicle
Switch	56.25%	A proportion, (75%*75%), of those people who elect to upgrade will sell their old vehicle and buy the cheapest unaffected one
Keep fuel	18.75%	A proportion, (25%*75%), of those people who decide to upgrade will sell their old vehicle and buy the cheapest unaffected one of the same fuel type
Redistribute	100.00%	A business will be able to relocate some of their fleet so as to vary their exposure to a measure
Substitute		Businesses will change operating areas, with those (un)affected by a measure substituting those (un)affected (for a cost raising / lowering measure)

Source: Shifting tool. Jacobs

Costs to purchase new Euro 6 compliant vehicle (Car price info year. Price 2018)

Vehicle	Cost	Assumption	Source
Car Petrol	£ 12,997		ANPR Weighted Costs_Rev2.xlsx
Car Diesel	£ 12,078		ANPR Weighted Costs_Rev2.xlsx
PHV Petrol	£ 12,997		ANPR Weighted Costs_Rev2.xlsx
PHV Diesel	£ 12,078		ANPR Weighted Costs_Rev2.xlsx
Taxi Petrol	£ 46,000		http://www.levc.com/new-taxis/new_tx4_taxi/
Taxi Diesel	£ 46,000	Only used for residual value	
LGV petrol	£ 13,328		ANPR Weighted Costs_Rev2.xlsx
LGV diesel	£ 13,328		ANPR Weighted Costs_Rev2.xlsx
Rigid HGV	£ 51,300	Average across a number of HGV types	Source: "Road Haulage Association Cost Tables 2014", DFF International Ltd, 2014
Artic HGV	£ 80,100	Average across a number of HGV types	Source: "Road Haulage Association Cost Tables 2014", DFF International Ltd, 2014
Buses	£ 160,000		JAQU
Coach	£ 250,000		JAQU

Other Upgrade Costs

Vehicle	Cost	Source
Bus cost of retrofit	£ 20,000	TfL Bus Retrofit Programme - £86m/5000 buses (Euro VI) https://www.airqualitynews.com/2017/06/28/86-1-million-london-bus-retrofit-programme-announced/

Derived Parameters

PHV proportion of Taxi	76%
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%age of planned upgrades by year (Do-Min). Assumed only for non complaint

Vehicle	Fuel	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Car Petrol	petrol	7%	6%	6%	6%	6%	7%	11%	10%	5%	1%
Car Diesel	diesel	9%	11%	11%	11%	11%	7%	11%	10%	5%	1%
PHV Petrol	petrol	7%	6%	6%	6%	6%	7%	11%	10%	5%	1%
PHV Diesel	diesel	9%	11%	11%	11%	11%	7%	11%	10%	5%	1%
Taxi Petrol	petrol	7%	6%	6%	6%	6%	7%	11%	10%	5%	1%
Taxi Diesel	diesel	9%	11%	11%	11%	11%	7%	11%	10%	5%	1%
LGV petrol	petrol	11%	12%	12%	12%	12%	6%	9%	8%	4%	1%
LGV diesel	diesel	11%	12%	12%	12%	12%	6%	9%	8%	4%	1%
HGV	rigid	4%	5%	5%	5%	5%	1%	2%	2%	1%	1%
HGV	artic	4%	5%	5%	5%	5%	1%	2%	2%	1%	1%
Bus	diesel	8%	8%	8%	8%	8%	1%	2%	2%	2%	2%

Source: GM Vehicle Data.xlsx

Upgrade Response

Vehicles scrapped	50%
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Health and Environmental Impact

2018 prices, undiscounted

Summary	Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total Nox Saved	11,274	1,419	1,335	1,251	1,167	1,083	1,056	1,022	995	978	967
NO2 Savings (£)	66,548,893	8,386,835	7,887,721	7,388,608	6,889,494	6,390,381	6,230,470	6,032,157	5,869,002	5,767,021	5,707,204
Total PM Saved	497	52	52	52	52	52	50	49	47	47	46
PM Savings (£)	62,464,423	6,593,651	6,556,800	6,519,949	6,483,098	6,446,248	6,284,938	6,084,892	5,920,310	5,817,438	5,757,098
Health and Environmental Impact	129,013,316	14,980,485	14,444,521	13,908,557	13,372,593	12,836,629	12,515,408	12,117,049	11,789,312	11,584,460	11,464,302

Source: Bryony Kershaw, Jacobs. Received 05/02/2018. \\EDIFIL01\Data\Environmental\Jobs\Economics\TfGM CAP\Incoming Data and Downloads

Discounted	Total	0.9019 2021	0.8714 2022	0.8420 2023	0.8135 2024	0.7860 2025	0.7594 2026	0.7337 2027	0.7089 2028	0.6849 2029	0.6618 2030
NO2 Savings (£)	52,331,683	7,564,444	6,873,693	6,221,010	5,604,608	5,022,782	4,731,491	4,425,980	4,160,646	3,950,097	3,776,932
PM Savings (£)	48,720,415	5,947,095	5,713,872	5,489,622	5,274,005	5,066,692	4,772,855	4,464,674	4,197,019	3,984,629	3,809,951
Health and Environmental Impact	101,052,098	13,511,540	12,587,566	11,710,632	10,878,613	10,089,474	9,504,346	8,890,654	8,357,665	7,934,726	7,586,884

draft for approval

Trips Cancelled or Re-moded 2021

This worksheet presents the AM, IP and PM peak hour trips either cancelled or re-moded, and converted into AADTs

Source: Adam James, Jacobs. Received 30/01/2018. \\EDIFIL01\Data\Environmental\Jobs\Economics\TfGM CAP\Incoming Data and Downloads

	Other Roads		
	AM Peak Hour to AM Peak Period	Inter-Peak Hour to Off-Peak Period	PM Peak Hour to PM Peak Period
Cars/Motorcycles	2.693	9.649	2.807
LGVS	3.125	9.649	3.071
Rigid HGVS	3.04	9.649	3.472
Articulated HGVS	3.018	9.649	3.049
Buses	2.941	9.649	3.098

Divisor for Trips to unique vehicles

	Total	Cars	Taxi	LGVs	HGV
Trips per day	2.82	2.63	9.65	2.79	2.95

AM Trips

	Non-Compliant Car	Non-Compliant LGV	Non-Compliant HGV	Non-Compliant Taxi	Non-Compliant PHV
Cancel Trip			118	22	
Switch to PT					
Switch to Active Mode					

IP Trips

	Non-Compliant Car	Non-Compliant LGV	Non-Compliant HGV	Non-Compliant Taxi	Non-Compliant PHV
Cancel Trip			128	29	
Switch to PT					
Switch to Active Mode					

PM Trips

	Non-Compliant Car	Non-Compliant LGV	Non-Compliant HGV	Non-Compliant Taxi	Non-Compliant PHV
Cancel Trip			58	45	
Switch to PT					
Switch to Active Mode					

AADT Conversion (non-compliant vehicles)

	AM			IP			PM		
	Cancel	Re-mode (PT)	Re-mode (Active travel)	Cancel	Re-mode (PT)	Re-mode (Active travel)	Cancel	Re-mode (PT)	Re-mode (Active travel)
Cars	-	-	-	-	-	-	-	-	-
LGVs	-	-	-	-	-	-	-	-	-
HGV	121	-	-	418	-	-	64	-	-
Taxi	6	-	-	29	-	-	13	-	-

Total Trips PT			
AM	IP	PM	Total
0	0	0	0
0	0	0	0
			0

Total AADTs

	Vehicles cancelling	Vehicles remoding
Cars	-	-
LGVs	-	-
HGV	603	-
Taxi	49	-

Trips Cancelled or Re-moded 2025

This worksheet presents the AM, IP and PM peak hour trips either cancelled or re-moded, and converted into AADTs

Source: Adam James, Jacobs. Received 30/01/2018. \\EDIFIL01\Data\Environmental\Jobs\Economics\TfGM CAP\Incoming Data and Downloads

	Other Roads		
	AM Peak Hour to AM Peak Period	Inter-Peak Hour to Off-Peak Period	PM Peak Hour to PM Peak Period
Cars/Motorcycles	2.693	9.649	2.807
LGVS	3.125	9.649	3.071
Rigid HGVS	3.04	9.649	3.472
Articulated HGVS	3.018	9.649	3.049
Buses	2.941	9.649	3.098

Divisor for Trips to unique vehicles

User Class	Total	Cars	Taxi	LGVs	HGV
Trips per day	2.82	2.63	9.65	2.79	2.95

AM Trips

	Non-Compliant Car	Non-Compliant LGV	Non-Compliant HGV	Non-Compliant Taxi	Non-Compliant PHV
Cancel Trip		822	37	6	
Switch to PT		651	-		
Switch to Active Mode		180	-		

IP Trips

	Non-Compliant Car	Non-Compliant LGV	Non-Compliant HGV	Non-Compliant Taxi	Non-Compliant PHV
Cancel Trip		794	40	8	
Switch to PT		612	-		
Switch to Active Mode		190	-		

PM Trips

	Non-Compliant Car	Non-Compliant LGV	Non-Compliant HGV	Non-Compliant Taxi	Non-Compliant PHV
Cancel Trip		686	18	12	
Switch to PT		536	-		
Switch to Active Mode		157	-		

AADT Conversion (non-compliant vehicles)

	AM			IP			PM		
	Cancel	Re-mode (PT)	Re-mode (Active travel)	Cancel	Re-mode (PT)	Re-mode (Active travel)	Cancel	Re-mode (PT)	Re-mode (Active travel)
Cars	-	-	-	-	-	-	-	-	-
LGVs	920	729	202	2,744	2,117	658	755	590	173
HGV	38	-	-	130	-	-	20	-	-
Taxi	2	-	-	8	-	-	4	-	-

Total AADTs

	Vehicles cancelling	Vehicles remodding
Cars	-	-
LGVs	4,420	4,469
HGV	188	-
Taxi	13	-

Carbon reduction

This page summarises the carbon reduction data due to the CAP

Table 3 - Carbon benefits of DS (central case CO2e price selected)

Source: \\EDIFIL01\Data\Environmental\Jobs\Economics\TfGM CAP\0_Project Works\Economic model\CO2 reduction

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
CO2e (t)	- 141,737	- 141,324	- 140,911	- 140,499	- 140,086	- 139,673	- 139,262	- 138,851	- 138,442	- 138,034	- 1,398,819
Value (£, 2018 prices)	9,960,534	10,094,342	10,227,199	10,359,105	10,490,060	10,620,064	10,749,212	10,877,506	11,004,950	11,131,550	105,514,522

draft for approval

Vehicle Upgrade Response

This sheet takes frequency data and converts the behavioural response (modelled on a per-trip basis) to vehicles, based on the assumption that more frequent CAZ users will be the first to upgrade

Data coming from ANPR data projected to 2021

Non-compliant vehicles		Frequency (abs) - non-compliant vehicles							Total
Vehicle	Fuel	1	2	3	4	5	6	7	
Car	Diesel	-	-	-	-	-	-	-	-
Car	Petrol	-	-	-	-	-	-	-	-
Car	Other	-	-	-	-	-	-	-	-
Hackney	Taxi	342	153	138	138	140	256	573	1,740
Hackney	Taxi	-	-	-	-	-	-	-	-
PHV	Diesel	252	225	208	223	263	301	390	1,861
PHV	Petrol	-	-	-	-	-	-	-	-
PHV	Other	-	-	-	-	-	-	-	-
Van	LGV	15,192	6,027	3,575	2,414	2,088	874	277	30,447
Van	LGV	-	-	-	-	-	-	-	-
HGV	Diesel	3,382	1,042	526	363	289	88	41	5,732
HGV	Petrol	-	-	-	-	-	-	-	-
Bus	Diesel	271	115	64	88	112	146	156	953
Bus	Petrol	-	-	-	-	-	-	-	-

Non-compliant vehicles		Frequency (abs) - non-compliant vehicles							Total
Vehicle		1	2	3	4	5	6	7	
Car		-	-	-	-	-	-	-	-
Taxi		342	153	138	138	140	256	573	1,740
PHV		252	225	208	223	263	301	390	1,861
LGV		15,192	6,027	3,575	2,414	2,088	874	277	30,447
HGV		3,382	1,042	526	363	289	88	41	5,732
Bus		271	115	64	88	112	146	156	953

Non-compliant vehicles		Frequency (proportion) - non-compliant vehicles							Total
Vehicle		1	2	3	4	5	6	7	
Car		0%	0%	0%	0%	0%	0%	0%	0%
Taxi		20%	9%	8%	8%	8%	15%	33%	100%
PHV		14%	12%	11%	12%	14%	16%	21%	100%
LGV		50%	20%	12%	8%	7%	3%	1%	100%
HGV		59%	18%	9%	6%	5%	2%	1%	100%
Bus		28%	12%	7%	9%	12%	15%	16%	100%

DM Non-compliant vehicle flows

Area	AM Peak Hour	IP Peak Hour	PM Peak Hour	AM Period	IP Period	PM Period	AADT	
Car	GM	27,015	21,688	30,394	72,751	209,267	85,315	367,333
Taxi	GM	3,758	3,017	4,267	10,121	29,113	11,977	51,211
LGV	GM	9,203	9,264	7,237	28,761	89,384	22,226	140,370
HGV	GM	2,715	3,092	1,259	8,224	29,837	4,106	42,166
Bus	GM	1,915	1,712	1,515	5,633	16,516	4,694	26,843

DM Non-compliant vehicle flows (AADT)

Non-compliant vehicles		Frequency (abs) - non-compliant vehicles							Total
Vehicle	Total	1	2	3	4	5	6	7	
Car	367,333	-	-	-	-	-	-	-	-
Taxi	12,342	2,426	1,085	979	979	993	1,816	4,064	12,342
PHV	38,869	5,258	4,707	4,335	4,663	5,484	6,284	8,138	38,869
LGV	140,370	70,040	27,789	16,482	11,128	9,628	4,027	1,278	140,370
HGV	42,166	24,880	7,669	3,872	2,673	2,125	647	300	42,166
Bus	26,843	7,645	3,236	1,811	2,490	3,166	4,111	4,384	26,843

DM Non-compliant vehicle flows (weekly)

Non-compliant vehicles		Frequency (abs) - non-compliant vehicles							Total
Vehicle	Total	1	2	3	4	5	6	7	
Car	-	-	-	-	-	-	-	-	-
Taxi	55,759	2,426	2,170	2,937	3,915	4,965	10,895	28,450	55,759
PHV	168,420	5,258	9,414	13,006	18,650	27,422	37,706	56,965	168,420
LGV	300,819	70,040	55,577	49,445	44,510	48,138	24,165	8,945	300,819
HGV	79,136	24,880	15,338	11,616	10,690	10,626	3,885	2,101	79,136
Bus	100,694	7,645	6,471	5,434	9,961	15,831	24,665	30,685	100,694

Behaviour response - Upgrade

Assumption: The first to upgrade will be the ones that make the trip more often

					Number of times entering CAZ												Remaining trips without vehicle upgrade	Total Vehicle Upgrade	Vehicle upgrade as a proportion of total daily non-compliant vehicles	
Vehicle	Fuel	% of all trips that upgrade	Weekly trips	No. trips to upgrade	7	6	5	4	3	2	1	Remaining trips	enter CAZ	Remaining trips	enter CAZ	Remaining trips				enter CAZ
Car	Petrol	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Car	Diesel	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Taxi	Petrol	100%	55,759	55,759	4,064	27,308	1,816	16,413	993	11,448	979	7,533	979	4,596	1,085	2,426	2,426	-	12,342	100%
Taxi	Diesel	100%	55,759	55,759	4,064	27,308	1,816	16,413	993	11,448	979	7,533	979	4,596	1,085	2,426	2,426	-	12,342	100%
PHV	Petrol	70%	168,420	117,557	8,138	60,593	6,284	22,887	4,577	-	-	-	-	-	-	-	-	-	19,000	49%
PHV	Diesel	70%	168,420	117,557	8,138	60,593	6,284	22,887	4,577	-	-	-	-	-	-	-	-	-	19,000	49%
LGV	Petrol	75%	300,819	226,817	1,278	217,873	4,027	193,708	9,628	145,571	11,128	101,060	16,482	51,616	25,808	-	-	-	68,350	49%
LGV	Diesel	75%	300,819	226,817	1,278	217,873	4,027	193,708	9,628	145,571	11,128	101,060	16,482	51,616	25,808	-	-	-	68,350	49%
HGV	Diesel	87%	79,136	68,453	300	66,351	647	62,467	2,125	51,841	2,673	41,151	3,872	29,535	7,669	14,197	14,197	-	31,483	75%
Bus	Diesel	100%	100,694	100,694	4,384	70,008	4,111	45,343	3,166	29,512	2,490	19,550	1,811	14,117	3,236	7,645	7,645	-	26,843	100%
Coach	Diesel	100%	100,694	100,694	4,384	70,008	4,111	45,343	3,166	29,512	2,490	19,550	1,811	14,117	3,236	7,645	7,645	-	26,843	100%

Summary of Response

Vehicle Type	Vehicles upgrading
Car	0%
Taxi	100%
PHV	49%
LGV	49%
HGV	75%
Bus	100%
Coach	100%

Vehicles fleet - Do Something																							
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
2023																							
Euro Class		0	1	2	3	4	5	6	6c	6d	Compliant	Non-Compliant	Total	Car Total		Taxi Total		PHEV Total		LGV Total		HG Total	
Petrol		15,657	114,822	179,804	136,142	174,330	16,514	627,270	515,485	45,036	12,950	6	2,176	20	1,105	10,222	2	717	12,047	117,835	117,835	32,152	2,885
Diesel		3,740	33,659	109,406	138,422	205,124	24,134	515,485	45,036	12,950	6	2,176	20	1,105	10,222	2	717	12,047	117,835	117,835	32,152	2,885	
Electric		22	13	473	44,462	78	28	45,036	12,950	6	2,176	20	1,105	10,222	2	717	12,047	117,835	117,835	32,152	2,885		
Other		3	8	13	11	1	1	12,950	6	2,176	20	1,105	10,222	2	717	12,047	117,835	117,835	32,152	2,885			
Taxi		24	49	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PHEV		18	13	34	222	3,353	121	1,105	10,222	2	717	12,047	117,835	117,835	32,152	2,885							
LGV		36	156	16,530	60,468	13,056	17,375	91,769	30,377	1,775	1,806	288	2,885										
HG		122	283	1,407	28,481	2,387	1,806	30,377	1,775	1,806	288	2,885											
Bus		2,596	2,596	2,596	2,596	2,596	2,596	2,596	2,596	2,596	2,596	2,596											
Other		288	288	288	288	288	288	288	288	288	288	288											
Total		18,108	158,481	229,726	285,046	383,232	46,142	1,216,220	62,142	16,142	20,142	21,142	120,142	120,142	34,142	2,885							

2023					
		DM		DS	
		Nr Vehicles	% Vehicles	Nr Vehicles	% Vehicles
Car Diesel	627,270	99.8%	627,270	99.8%	
PHEV Diesel	1,105	0.2%	1,105	0.2%	
Total	628,375	100%	628,375	100%	
Car Diesel	515,485	88.1%	515,485	88.1%	
PHEV Diesel	10,222	1.9%	10,222	1.9%	
Total	525,707	100%	525,707	100%	
Car Diesel	2,176	99.7%	2,176	99.7%	
Total	2,182	100.0%	2,182	100.0%	

Compliant vehicles percentage																							
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
2024																							
Euro Class		0	1	2	3	4	5	6	6c	6d	Compliant	Non-Compliant	Total	Car Total		Taxi Total		PHEV Total		LGV Total		HG Total	
Petrol		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Diesel		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Electric		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Other		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Taxi		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
PHEV		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
LGV		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
HG		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Bus		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Other		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Total		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

2024					
		DM		DS	
		Nr Vehicles	% Vehicles	Nr Vehicles	% Vehicles
Car Diesel	627,270	99.8%	627,270	99.8%	
PHEV Diesel	1,105	0.2%	1,105	0.2%	
Total	628,375	100%	628,375	100%	
Car Diesel	515,485	88.1%	515,485	88.1%	
PHEV Diesel	10,222	1.9%	10,222	1.9%	
Total	525,707	100%	525,707	100%	
Car Diesel	2,176	99.7%	2,176	99.7%	
Total	2,182	100.0%	2,182	100.0%	

Vehicles upgrading due to age planned upgrade																							
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
2024																							
Euro Class		0	1	2	3	4	5	6	6c	6d	Compliant	Non-Compliant	Total	Car Total		Taxi Total		PHEV Total		LGV Total		HG Total	
Petrol		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Diesel		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Electric		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Other		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Taxi		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PHEV		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
LGV		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
HG		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bus		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Other		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

2024					
		DM		DS	
		Nr Vehicles	% Vehicles	Nr Vehicles	% Vehicles
Car Diesel	627,270	99.8%	627,270	99.8%	
PHEV Diesel	1,105	0.2%	1,105	0.2%	
Total	628,375	100%	628,375	100%	
Car Diesel	515,485	88.1%	515,485	88.1%	
PHEV Diesel	10,222	1.9%	10,222	1.9%	
Total	525,707	100%	525,707	100%	
Car Diesel	2,176	99.7%	2,176	99.7%	
Total	2,182	100.0%	2,182	100.0%	

Vehicles fleet - Do Something																							
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
		Car Diesel		Car Electric		Car Other		Taxi Diesel		Taxi Diesel		Taxi Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel		PHEV Diesel	
2024																							
Euro Class		0	1	2	3	4	5	6	6c	6d	Compliant	Non-Compliant	Total	Car Total		Taxi Total		PHEV Total		LGV Total		HG Total	
Petrol		14,726	139,592	199,968	136,364	174,330	16,514	627,270	515,485	45,036	12,950	6	2,176	20	1,105	10,222	2	717	12,047	117,835	117,835	32,152	2,885
Diesel		3,338	30,040	109,406	141,137	205,124	24,134	515,485	45,036	12,950	6	2,176	20	1,105	10,222	2	717	12,047	117,835	117,835	32,152	2,885	
Electric		21	13	473	44,462	78	28	45,036	12,950	6	2,176	20	1,105	10,222	2	717	12,047	117,835	117,835	32,152	2,885		
Other		8	13	13	11	1	1	12,950	6	2,176	20	1,105	10,222	2	717	12,047	117,835	117,835	32,152	2,885			
Taxi		24	49	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PHEV		18	13	34	222	3,353	121	1,105	10,222	2	717	12,047	117,835	117,835	32,152	2,885							
LGV		36	156	16,530	60,468	13,056	17,375	91,769	30,377	1,775	1,806	288	2,885										
HG		122	283	1,407	28,481	2,387	1,806	30,377	1,775	1,806	288	2,885											
Bus		2,596	2,596	2,596	2,596	2,596	2,596	2,596	2,596	2,596	2,596	2,596											
Other		288	288	288	288	288	288	288	288	288	288	288											
Total		18,108	158,481	229,726	285,046	383,232	46,142	1,216,220	62,142	16,142	20,142	21,142	120,142	120,142	34,142	2,885							

Euro Class	Car			Taxi			PVV			LGV			HGV			Bus			
	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
5	8%	0%	0%	1%	29%	0%	0%	8%	28%	2%	0%	0%	0%	0%	0%	0%	0%	0%	
6	8%	29%	27%	0%	0%	62%	0%	0%	30%	0%	1%	54%	0%	94%	1%	90%	0%	0%	
6c	14%	56%	0%	0%	0%	0%	0%	14%	53%	8%	1%	18%	0%	0%	0%	0%	0%	0%	
6d	3%	15%	8%	0%	0%	38%	0%	0%	17%	3%	0%	0%	28%	0%	0%	0%	0%	10%	
Sub-total	39%	100%	36%	3%	35%	100%	31%	39%	100%	36%	7%	0%	100%	0%	0%	100%	0%	100%	
Total		Car Total			Taxi Total			PVV Total		181%			LGV Total		100%		HGV Total		100%

Euro Class	Car			Taxi			PVV			LGV			HGV			Bus			
	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	1,116	247	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	8,181	2,218	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	13,078	7,250	34	-	-	-	-	-	23	67	0	-	910	-	-	58	-	-	
6	12,542	12,223	3,577	-	-	-	136	-	33	282	0	-	4,474	-	-	3,447	-	-	
6c	20,330	23,447	17	-	-	-	-	-	36	489	0	-	1,504	-	-	-	-	315	
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub-total	54,848	45,426	3,632	-	-	-	136	-	96	861	0	-	7,413	-	-	1,519	-	215	
Total		Car Total			Taxi Total		136		PVV Total	957			LGV Total	7,413		HGV Total	1,519		Bus Total

Euro Class	Car			Taxi			PVV			LGV			HGV			Bus			
	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
0	-	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	-	-	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	-	-	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	10,415	2,217	7	-	-	-	18	9	20	-	-	-	36	-	-	95	-	-	
4	76,377	19,922	11	2,503	1	0	1	135	183	-	156	-	5,794	-	-	189	-	-	
5	122,931	65,772	323	6,527	5	0	1	230	693	1	261	-	10,043	-	-	1,087	-	-	
6	119,493	11,493	3,060	0	1,224	-	-	211	2,551	-	121	-	49,795	-	-	28,760	-	2,596	
6c	199,604	216,260	181	-	-	-	-	354	4,448	0	183	-	17,287	-	-	1,087	-	-	
6d	98,450	99,792	13,093	-	-	-	862	783	2,416	0	177	-	34,090	-	-	2,017	-	389	
Compliant	627,270	515,485	45,024	12,950	6	2,176	20	1,105	9,416	1	284	-	101,997	-	-	30,782	-	2,885	
Non-Compliant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub-total	627,270	515,485	45,024	12,950	6	2,176	20	1,105	9,417	1	284	-	101,997	-	-	30,782	-	2,885	
Total		Car Total			Taxi Total		2,202		PVV Total	12,047			LGV Total	117,835		HGV Total	32,152		Bus Total

Euro Class	DM		DS	
	No. Vehicles	% Vehicles	No. Vehicles	% Vehicles
Car Petrol	627,270	99.8%	627,270	99.8%
Petrol/Other	1,105	0.2%	1,105	0.2%
Total	628,375	100%	628,375	100%
Car Diesel	515,485	98.1%	515,485	98.1%
Petrol/Other	10,222	1.9%	10,222	1.9%
Total	525,707	100%	525,707	100%
Car Diesel	515,485	99.7%	515,485	99.7%
Petrol/Other	2,176	0.3%	2,176	0.3%
Total	517,661	100%	517,661	100%

Euro Class	Car			Taxi			PVV			LGV			HGV			Bus			
	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
0	-	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	-	-	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	-	-	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	10,415	2,217	7	-	-	-	18	9	20	-	-	-	36	-	-	95	-	-	
4	76,377	19,922	11	2,503	1	0	1	135	183	-	156	-	5,794	-	-	189	-	-	
5	122,931	65,772	323	6,527	5	0	1	230	693	1	261	-	10,043	-	-	1,087	-	-	
6	119,493	11,493	3,060	0	1,224	-	-	211	2,551	-	121	-	49,795	-	-	28,760	-	2,596	
6c	199,604	216,260	181	-	-	-	-	354	4,448	0	183	-	17,287	-	-	1,087	-	-	
6d	98,450	99,792	13,093	-	-	-	862	783	2,416	0	177	-	34,090	-	-	2,017	-	389	
Compliant	627,270	515,485	45,024	12,950	6	2,176	20	1,105	9,416	1	284	-	101,997	-	-	30,782	-	2,885	
Non-Compliant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub-total	627,270	515,485	45,024	12,950	6	2,176	20	1,105	9,417	1	284	-	101,997	-	-	30,782	-	2,885	
Total		Car Total			Taxi Total		2,202		PVV Total	12,047			LGV Total	117,835		HGV Total	32,152		Bus Total

Euro Class	DM		DS	
	No. Vehicles	% Vehicles	No. Vehicles	% Vehicles
Car Petrol	627,270	99.8%	627,270	99.8%
Petrol/Other	1,105	0.2%	1,105	0.2%
Total	628,375	100%	628,375	100%
Car Diesel	515,485	98.1%	515,485	98.1%
Petrol/Other	10,222	1.9%	10,222	1.9%
Total	525,707	100%	525,707	100%
Car Diesel	515,485	99.7%	515,485	99.7%
Petrol/Other	2,176	0.3%	2,176	0.3%
Total	517,661	100%	517,661	100%

Euro Class	Car			Taxi			PVV			LGV			HGV			Bus			
	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	537.44	118	0.89	0.00	0.00	0	0	1	-	-	-	-	0.27	-	-	5	-	-	
4	5,941.22	1,005	6.53	0.00	0.00	0	0	1	89	-	-	-	89	-	-	89	-	-	
5	6,343.48	3,511	16.68	0.25	0.00	0	0	0	32	0	-	-	445	-	-	55	-	-	
6	6,166.07	3,952	17,231.13	-	69.33	-	-	11	136	-	-	-	2,206	-	-	1,449	-	215	
6c	10,000.00	11,546	8.33	-	-	-	-	18	237	0	-	-	766	-	-	-	-	0	
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub-total	27,288	22,193	1,751	-	-	-	65	66	48	417	0	-	3,673	-	-	1,518	-	215	
Total		Car Total			Taxi Total		66		PVV Total	485			LGV Total	3,673		HGV Total	1,518		Bus Total

Euro Class	DM		DS	
	No. Vehicles	% Vehicles	No. Vehicles	% Vehicles
Car Petrol	627,270	99.8%	627,270	99.8%
Petrol/Other	1,105	0.2%	1,105	0.2%
Total	628,375	100%	628,375	100%
Car Diesel	515,485	98.1%	515,485	98.1%
Petrol/Other	10,222	1.9%	10,222	1.9%
Total	525,707	100%	525,707	100%
Car Diesel	515,485	99.7%	515,485	99.7%
Petrol/Other	2,176	0.3%	2,176	0.3%
Total	517,661	100%	517,661	100%

Euro Class	Car			Taxi			PVV			LGV			HGV			Bus		
	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Electric	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
0	-	-	24	-														

Vehicles upgrading due to age planned upgrade

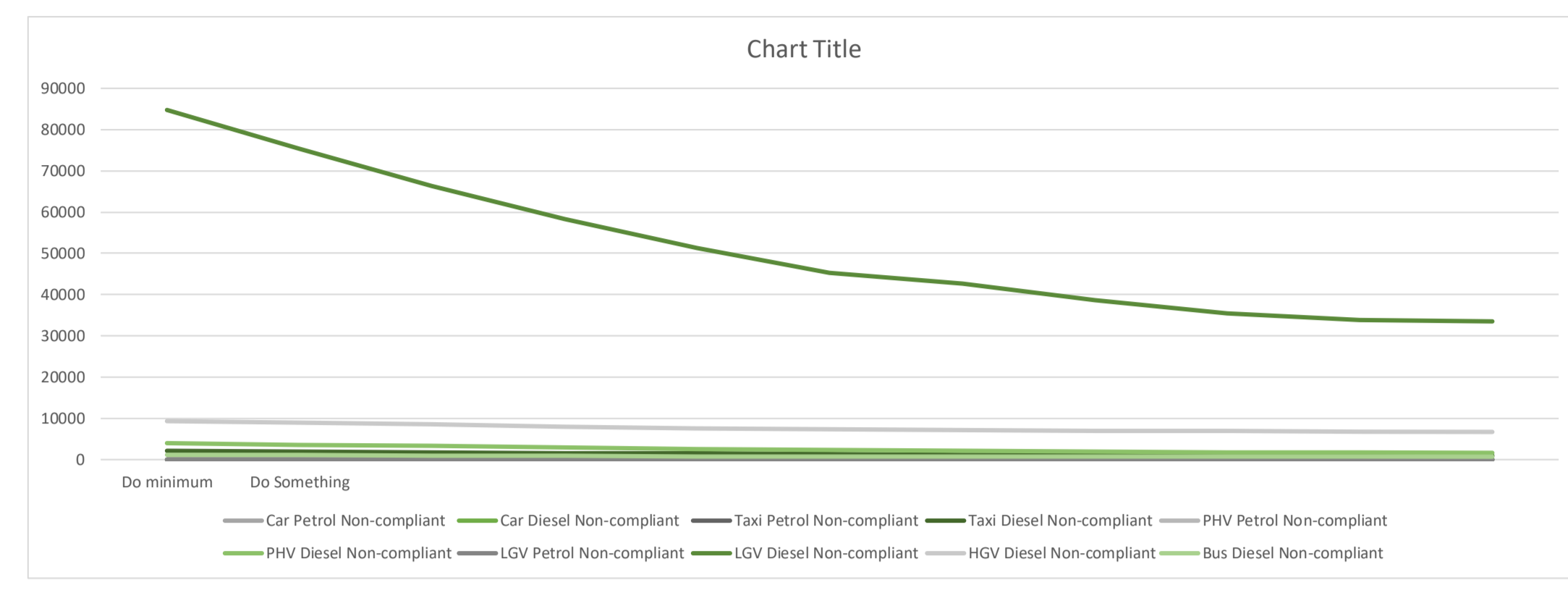
Euro Class	Car				Taxi			PHV			LGV			HGV			Bus				
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other		
0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	127	28	0	-	7	7	-	2	5	-	-	-	-	-	-	-	-	-	-	1	
4	934	252	0	-	7	7	-	2	5	-	-	-	137	-	-	10.18	-	-	-	1	
5	1,509	832	4	-	4	4	-	3	17	0	-	-	238	-	-	59	-	-	-	9	
6	1,500	1,410	409	-	6	6	-	3	28	-	-	-	396	-	-	265	-	-	-	31	
6c	2,503.50	2,767.43	2.37	-	3.40	3.40	-	4.43	54.88	0.01	-	-	237.21	-	-	-	-	-	-	-	
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-total	6,575	5,299	413	-	22	22	-	12	105	0	-	-	1,008	-	-	335	-	-	-	43	
Total	Car Total 12,289				Taxi Total 22			PHV Total 12			LGV Total 1,008			HGV Total 335			Bus Total 43				

Vehicles fleet - Do Minimum

Euro Class	Car				Taxi			PHV			LGV			HGV			Bus			
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
0	-	-	2	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	2	-	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	5	-	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9,750	2,071	15	-	731	-	-	18	17	41	-	-	36	-	-	462	-	-	-	52
4	72,501	18,635	10	-	2,503	1	-	692	1	326	370	-	156	-	-	12,257	-	-	-	52
5	215,577	61,537	203	-	6,527	9	-	325	204	2,203	1	-	241	-	-	21,346	-	-	-	528
6	115,483	105,110	31,262	-	3,050	-	-	440	-	2,084	-	-	121	-	-	35,424	-	-	-	1,970
6c	392,690	205,205	185	-	-	-	-	255	-	339	4,069	1	163	-	-	21,361	-	-	-	319
6d	112,268	123,928	33,239	-	-	-	-	527	-	215	2,438	0	-	-	-	27,546	-	-	-	1,706
Compliant	627,270	515,485	45,024	-	12,950	6	-	1,222	20	1,105	8,591	2	717	-	-	84,332	-	-	-	2,889
Non-Compliant	-	-	-	-	-	-	-	954	-	1,631	-	-	-	-	-	33,503	-	-	-	696
Sub-total	627,270	515,485	45,024	-	12,950	6	-	2,176	20	1,105	10,222	2	717	-	-	117,835	-	-	-	2,889
Total	Car Total 1,206,728				Taxi Total 2,202			PHV Total 12,047			LGV Total 117,835			HGV Total 32,152			Bus Total 2884,987			

Annual vehicle fleet composition by fuel type

Vehicle	Fuel	Compliance	Do minimum						Do Something							
			2021	2022	2023	2024	2025	2026	2027	2028	2029	2030				
Car	Petrol	Compliant	627270	627270	627270	627270	627270	627270	627270	627270	627270	627270	627270	627270	627270	627270
	Petrol	Non-compliant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Car	Diesel	Compliant	515485	515485	515485	515485	515485	515485	515485	515485	515485	515485	515485	515485	515485	515485
	Diesel	Non-compliant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taxi	Petrol	Compliant	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Petrol	Non-compliant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHV	Petrol	Compliant	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105
	Petrol	Non-compliant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LGV	Petrol	Compliant	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Petrol	Non-compliant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HGV	Petrol	Compliant	49	215	401	569	722	860	941	1063	1162	1210	1222	1222	1222	1222
	Petrol	Non-compliant	2121	1961	1773	1607	1454	1316	1195	1113	1014	966	904	854	806	760
Bus	Petrol	Compliant	2176	2176	2176	2176	2176	2176	2176	2176	2176	2176	2176	2176	2176	2176
	Petrol	Non-compliant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Do minimum	Petrol	Compliant	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105
	Petrol	Non-compliant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Do Something	Petrol	Compliant	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105	1105
	Petrol	Non-compliant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHV	Petrol	Compliant	6270	6270	6270	6270	6270	6270	6270	6270	6270	6270	6270	6270	6270	6270
	Petrol	Non-compliant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LGV	Petrol	Compliant	10222	10222	10222	10222	10222	10222	10222	10222	10222	10222	10222	10222	10222	10222
	Petrol	Non-compliant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HGV	Petrol	Compliant	38076	43530	51547	64841	84481	113300	155445	219775	314545	469975	719975	1119975	1749975	2749975
	Petrol	Non-compliant	84758	75144	66288	58343	51351	45197	42590	38559	35448	33078	33059	33059	33059	
Bus	Petrol	Compliant	117835	117835	117835	117835	117835	117835	117835	117835	117835	117835	117835	117835	117835	117835
	Petrol	Non-compliant	22823	23222	23872	24095	24505	24900	25305	25710	26115	26520	26925	27330	27735	28140
Total	Petrol	Compliant	9324	8930	8480	8052	7647	7262	7159	6996	6863	6779	6705	6705	6705	
	Petrol	Non-compliant	32152	32152	32152	32152	32152	32152	32152	32152	32152	32152	32152	32152	32152	
Bus	Petrol	Compliant	1751	1824	1932	1992	2066	2134	2142	2155	2167	2178	2189	2199	2209	
	Petrol	Non-compliant	1154	1061	973	893	819	751	743	730	718	707	696	685	674	
Total	Petrol	Compliant	2885	2885	2885	2885	2885	2885	2885	2885	2885	2885	2885	2885	2885	
	Petrol	Non-compliant	0	0	0	0	0	0	0	0	0	0	0	0	0	



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Active travel

Cumulative Active travel impact

Type	2021
Walking	1,940,000
Cycling	24,200,000
Total	26,140,000

Source: \\EDIFIL01\Data\Environmental\Jobs\Economics\TfGM CAP\0_Project Works\Economic model\Active travel

Cumulative Upgraded vehicles (2018 prices, in Euro).

Type	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Walking	194,000	194,000	194,000	194,000	194,000	194,000	194,000	194,000	194,000	194,000	1,940,000
Cycling	2,420,000	2,420,000	2,420,000	2,420,000	2,420,000	2,420,000	2,420,000	2,420,000	2,420,000	2,420,000	24,200,000
Total	2,614,000	2,614,000	2,614,000	2,614,000	2,614,000	2,614,000	2,614,000	2,614,000	2,614,000	2,614,000	26,140,000

Cumulative Upgraded vehicles (2018 prices, in £)

Type	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Walking	172,955	172,955	172,955	172,955	172,955	172,955	172,955	172,955	172,955	172,955	1,729,549
Cycling	2,157,478	2,157,478	2,157,478	2,157,478	2,157,478	2,157,478	2,157,478	2,157,478	2,157,478	2,157,478	21,574,781
Total	2,330,433	2,330,433	2,330,433	2,330,433	2,330,433	2,330,433	2,330,433	2,330,433	2,330,433	2,330,433	23,304,329

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LGVs	-	-	5,904,605	4,795,325	3,674,535	2,996,196	1,876,287	917,949	449,094	329,570	20,943,561
HGV	7,260,822	5,903,962	4,576,300	3,303,062	2,082,520	1,671,951	1,022,475	500,232	195,786	143,678	26,660,788
Taxi	43,890	35,222	26,751	18,629	10,844	8,557	5,358	2,294	962	627	153,134
Total	7,304,711	5,939,185	10,507,656	8,117,016	5,767,898	4,676,704	2,904,121	1,420,475	645,842	473,876	47,757,483

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Consumer Welfare Loss - Trips Remoded

This worksheet calculates the welfare loss associated with trips being re-moded

Assumptions

- 1) Due to the sunset period in 2021 and 2022, the interpolation between 2021 and 2025 is not linear for LGVs
- 2) Bus are assumed not to cancel/remode any trips

ROH	0.5
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	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Cars	100%	84%	68%	52%	37%	30%	19%	9%	5%	3%
LGVs	100%	83%	2348%	1949%	1526%	1272%	814%	407%	204%	153%
HGV	100%	83%	66%	48%	31%	26%	16%	8%	3%	2%
Taxi	100%	82%	64%	46%	28%	22%	14%	6%	3%	2%

Number of trips re-moded

	2021		2025	
	Remoded trips	Trips (Annual)	Remoded trips	Trips (Annual)
Cars	-	-	-	-
LGVs	-	-	4,469	1,130,717
HGV	-	-	-	-
Taxi	-	-	-	-
Total	-	-	4,469.24	-

CAZ Charge (2021 prices)

	Low	Medium	High
Cars	5.00	7.50	10.00
LGVs	5.00	7.50	10.00
HGV	100.00	100.00	100.00
Taxi	5.00	7.50	10.00

Welfare Loss (2021)

	2021			2025		
	Low	Medium	High	Low	Medium	High
Cars	-	-	-	-	-	-
LGVs	-	-	-	2,826,791	4,240,187	5,653,583
HGV	-	-	-	-	-	-
Taxi	-	-	-	-	-	-

Welfare Loss (appraisal period) - Medium Charge (2021 prices)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Cars	-	-	-	-	-	-	-	-	-	-	-
LGVs	-	-	6,523,365	5,414,393	4,240,187	3,533,489	2,261,433	1,130,717	565,358	424,019	24,092,960
HGV	-	-	-	-	-	-	-	-	-	-	-
Taxi	-	-	-	-	-	-	-	-	-	-	-

Welfare Loss (appraisal period) - Medium Charge (2018 prices)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Cars	-	-	-	-	-	-	-	-	-	-	-
LGVs	-	-	5,970,674	4,848,982	3,715,651	3,029,722	1,897,282	928,220	454,119	333,258	21,177,910
HGV	-	-	-	-	-	-	-	-	-	-	-
Taxi	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	5,970,674	4,848,982	3,715,651	3,029,722	1,897,282	928,220	454,119	333,258	21,177,910

Cost of Bus Retrofitting

This worksheet calculates the welfare loss of bus operators choosing to retrofit their non-compliant buses

Assumptions

1) Bus euro 6 are assumed not to need retrofitting

ROH 0.5

Bus fleet retrofitting

2021	Bus		
	Petrol	Diesel	Other
Euro Class			
0			
1			
2			
3			
4			87
5			981
6			
6c			
6d			
Total	Bus Total		1,067

Assumption: only euro 4 and 5s can be retrofitted (source: Alec Curley and Clare Sheffield)

Cost of Bus Retrofitting

2021	Bus		
	Petrol	Diesel	Other
Euro Class			
0	-	-	-
1	-	-	-
2	-	-	-
3	-	-	-
4	-	865,497	-
5	-	9,808,962	-
6	-	-	-
6c	-	-	-
6d	-	-	-
Total	Bus Total		10,674,458

Cost of Upgrading

Calculates total cost of upgrading based on the fleet that would upgrade
 Takes the number of cars upgrading and multiplies by the cost calculated in Dif in Depreciation

Total Vehicles upgrading due to the scheme (2021 plus 2023)

Euro Class	Car				Taxi			PHV				LGV			HGV			Bus									
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other							
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
2	-	-	-	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-							
3	-	-	-	-	-	317	-	-	16	50	-	-	-	-	-	480	-	-	87	-							
4	-	-	-	-	-	1,205	-	-	-	450	-	-	-	11,809	-	-	960	-	-	87							
5	-	-	-	-	-	577	-	-	-	1,449	-	-	-	20,468	-	-	5,521	-	-	981							
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Sub-total	-	-	-	-	-	2,127	-	-	16	1,949	-	-	-	32,277	-	-	6,962	-	-	1,154							
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total									
							2,127							1,965			32,277			32,277			6,962			1,154	1153.99548

Vehicles upgrading to new vehicles

Euro Class	Car				Taxi			PHV				LGV			HGV			Bus								
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other						
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
2	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-						
3	-	-	-	-	-	79	-	-	4	12	-	-	-	-	-	120	-	-	22	-						
4	-	-	-	-	-	301	-	-	-	112	-	-	-	2,952	-	240	-	-	22	-						
5	-	-	-	-	-	144	-	-	-	362	-	-	-	5,117	-	1,380	-	-	245	-						
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Sub-total	-	-	-	-	-	532	-	-	4	487	-	-	-	8,069	-	1,740	-	-	288							
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total								
							532							491			8,069			8,069			1,740			288.49887

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Vehicles upgrading to used vehicles - same fuel

Euro Class	Car				Taxi			PHV				LGV			HGV			Bus				
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other		
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-		
3	-	-	-	-	-	59	-	-	3	9	-	-	-	-	-	-	90	-	-	16		
4	-	-	-	-	-	226	-	-	-	84	-	-	-	-	2,214	-	-	180	-	16		
5	-	-	-	-	-	108	-	-	-	272	-	-	-	-	3,838	-	-	1,035	-	184		
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sub-total	-	-	-	-	-	399	-	-	3	365	-	-	-	-	6,052	-	-	1,305	-	216		
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total				
							399					3	365			6,052			1,305			216

Vehicles upgrading to used vehicles - change fuel (cheapest option)

Euro Class	Car				Taxi			PHV				LGV			HGV			Bus				
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other		
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2	-	-	-	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-		
3	-	-	-	-	-	178	-	-	9	28	-	-	-	-	-	-	270	-	-	49		
4	-	-	-	-	-	678	-	-	-	253	-	-	-	-	6,642	-	-	540	-	49		
5	-	-	-	-	-	325	-	-	-	815	-	-	-	-	11,514	-	-	3,106	-	552		
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sub-total	-	-	-	-	-	1,197	-	-	9	1,096	-	-	-	-	18,156	-	-	3,916	-	649		
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total				
							1,197					9	1,096			18,156			3,916			649

Cost of Upgrading due to loss in vehicle value

Euro Class	Car				Taxi			PHV				LGV			HGV			Bus				
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other		
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2	-	-	-	-	-	-	142,672	-	-	-	-	-	-	-	-	-	-	-	-	-		
3	-	-	-	-	-	1,589,406	-	-	15,726	58,363	-	-	-	-	-	-	1,754,282	-	-	1,017,246		
4	-	-	-	-	-	5,869,279	-	-	-	508,312	-	-	-	-	13,545,257	-	-	3,446,286	-	999,104		
5	-	-	-	-	-	2,659,008	-	-	-	1,543,193	-	-	-	-	22,147,859	-	-	19,024,090	-	10,868,404		
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sub-total	-	-	-	-	-	10,260,365	-	-	15,726	2,109,868	-	-	-	-	35,693,116	-	-	24,224,658	-	12,884,754		
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total				
							10,260,365					15,726	2,109,868			35,693,116			24,224,658			12,884,754

Euro Class	Car				Taxi			PHV				LGV			HGV			Bus				
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other		
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2	-	-	-	-	-	-	9,434	-	-	-	-	-	-	-	-	-	-	-	-	-		
3	-	-	-	-	-	101,378	-	-	116	3,152	-	-	-	-	-	-	135,058	-	-	77,647		
4	-	-	-	-	-	334,730	-	-	-	24,603	-	-	-	-	685,667	-	-	243,275	-	69,931		
5	-	-	-	-	-	117,738	-	-	-	58,251	-	-	-	-	873,279	-	-	1,057,486	-	599,152		
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sub-total	-	-	-	-	-	563,281	-	-	116	86,007	-	-	-	-	1,558,946	-	-	1,435,819	-	746,729		
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total				
							563,281					116	86,007			1,558,946			1,435,819			746,729

Cost for vehicles upgrading to used vehi																					
Euro Class	Car				Taxi			PHV				LGV			HGV			Bus			
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	-	-	-	-	-	-	5,052	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	-	-	-	-	-	-	25,347	-	-	1,132	-	-	-	-	-	-	-	-	-	-	
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub-total	-	-	-	-	-	-	30,399	-	-	1,132	-	-	-	-	-	-	-	-	-	-	
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total			0

Total cost of upgrade																					
Euro Class	Car				Taxi			PHV				LGV			HGV			Bus			
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	-	-	-	-	-	-	157,159	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	-	-	-	-	-	-	1,716,131	-	-	16,973	61,515	-	-	-	-	-	1,889,340	-	-	1,094,893	
4	-	-	-	-	-	-	6,204,009	-	-	-	532,915	-	-	-	-	14,230,924	-	-	3,689,561	1,069,035	
5	-	-	-	-	-	-	2,776,747	-	-	-	1,601,445	-	-	-	-	23,021,139	-	-	20,081,576	11,467,556	
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub-total	-	-	-	-	-	-	10,854,045	-	-	16,973	2,195,875	-	-	-	-	37,252,062	-	-	25,660,477	13,631,483	
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total			13631483.29

Vehicle type	New vehicles	used vehicles - same fuel	used vehicles - change fuel (cheapest option)	Total
Car	-	-	-	-
LGV	35,693,116	1,558,946	-	37,252,062
HGV	24,224,658	1,435,819	-	25,660,477
PHV	2,125,594	86,122	1,132	2,212,848
Taxi	10,260,365	563,281	30,399	10,854,045
Bus	12,884,754	746,729	-	13,631,483
Coach	-	-	-	-
Total	85,188,487	4,390,898	31,531	89,610,916

2021 prices	Total
Car Petrol	-
Car Diesel	-
Car Electric	-
Car Other	-
Taxi Diesel	10,854,044.89
PHV Petrol	16,973.46
PHV Diesel	2,195,874.72
PHV Electric	-
PHV Other	-
LGV Diesel	37,252,062.36
HGV	25,660,477.14
Bus	13,631,483.29
Coach	-
Total	89,610,916

2018 prices (undiscounted)	Total
Car Petrol	-
Car Diesel	-
Car Electric	-
Car Other	-
Taxi Diesel	10,337,913
PHV Petrol	16,166
PHV Diesel	2,091,456
PHV Electric	-
PHV Other	-
LGV Diesel	35,480,651
HGV	24,440,269
Bus	12,983,279
Coach	-
Total	85,349,735

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Fuel switch cost

Calculates change in cost of fuel consumption for the users that switch to a difference fuel vehicle

Vehicle fleet - vehicles upgrading

2020	Car				Taxi			PHV				LGV			HGV			Bus		
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	317	-	16	50	-	-	-	-	-	-	480	-	-	87
4	-	-	-	-	-	-	1,205	-	-	450	-	-	-	11,809	-	-	960	-	-	87
5	-	-	-	-	-	-	577	-	-	1,449	-	-	-	20,468	-	-	5,521	-	-	981
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Compliant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Compliant	-	-	-	-	-	-	2,127	-	16	1,949	-	-	-	32,277	-	-	6,962	-	-	1,154
Sub-total	-	-	-	-	-	-	2,127	-	16	1,949	-	-	-	32,277	-	-	6,962	-	-	1,154
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total		
	1,200,741				2,202			12,047				117,835			32,152			2,885		

Vehicle changing fuel type FROM

2021	Car				Taxi			PHV				LGV			HGV			Bus		
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	28	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	253	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	815	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Compliant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Compliant	-	-	-	-	-	-	-	-	-	1,096	-	-	-	-	-	-	-	-	-	-
Sub-total	-	-	-	-	-	-	-	-	-	1,096	-	-	-	-	-	-	-	-	-	-
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total		
	117,835				-			1,096				-			-			-		

Vehicle km Diesel

2021	Car				Taxi			PHV				LGV			HGV			Bus		
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	1,130,799	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	10,177,191	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	32,793,170	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Compliant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Compliant	-	-	-	-	-	-	-	-	-	44,101,159	-	-	-	-	-	-	-	-	-	-
Sub-total	-	-	-	-	-	-	-	-	-	44,101,159	-	-	-	-	-	-	-	-	-	-
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total		
	-				-			44,101,159				-			-			-		

Vehicle changing fuel type TO

2021	Car				Taxi			PHV				LGV			HGV			Bus		
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	33.22	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	243.59	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	376.45	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	188	-	-	-	-	-	-	-	-	-	-
6c	-	-	-	-	-	-	-	-	-	254.66	-	-	-	-	-	-	-	-	-	-
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Compliant	-	-	-	-	-	-	-	-	-	1,063	-	-	-	-	-	-	-	-	-	-
Non-Compliant	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-	-	-
Sub-total	-	-	-	-	-	-	-	-	-	1,096	-	-	-	-	-	-	-	-	-	-
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total		
	-				-			1,096				-			-			-		

Vehicle km Petrol

2021	Car				Taxi			PHV				LGV			HGV			Bus			
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
0																					
1																					
2																					
3												1,336,399									
4												9,800,258									
5												15,145,853									
6												7,572,926									
6c												10,245,724									
6d												-									
Compliant																					
Non-Compliant																					
Sub-total												44,101,159									
Total																					
	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total			

Assumption: the annual vehicle km are the one related to the diesel category in both cases

Average consumption per euro class (Year 2021)

Vehicle	Fuel	Euro class	Average year	fuel consumption (litres per km)	Vehicle km	fuel consumption (litres)	fuel cost (2018 price) (£/litre)	Fuel cost (2018 price)
Car	Petrol	Euro 0	0	-	-	-	£ 1.089	£ -
Car	Petrol	Euro 1	1995	-	-	-	£ 1.089	£ -
Car	Petrol	Euro 2	1999	-	-	-	£ 1.089	£ -
Car	Petrol	Euro 3	2004	0.076	-	-	£ 1.089	£ -
Car	Petrol	Euro 4	2008	0.070	-	-	£ 1.089	£ -
Car	Petrol	Euro 5	2013	0.056	-	-	£ 1.089	£ -
Car	Petrol	Euro 6 / Electric	2016	0.054	-	-	£ 1.089	£ -
Car	Petrol	Euro 6c	2016	0.054	-	-	£ 1.089	£ -
Car	Petrol	Euro 6d	2016	0.054	-	-	£ 1.089	£ -
Car	Diesel	Euro 0	0	-	-	-	£ 1.128	£ -
Car	Diesel	Euro 1	1995	-	-	-	£ 1.128	£ -
Car	Diesel	Euro 2	1999	-	-	-	£ 1.128	£ -
Car	Diesel	Euro 3	2004	0.062	-	-	£ 1.128	£ -
Car	Diesel	Euro 4	2008	0.059	-	-	£ 1.128	£ -
Car	Diesel	Euro 5	2013	0.049	-	-	£ 1.128	£ -
Car	Diesel	Euro 6 / Electric	2016	0.045	-	-	£ 1.128	£ -
Car	Diesel	Euro 6c	2016	0.045	-	-	£ 1.128	£ -
Car	Diesel	Euro 6d	2016	0.045	-	-	£ 1.128	£ -
PHV	Petrol	Euro 0	0	-	-	-	£ 1.089	£ -
PHV	Petrol	Euro 1	1995	-	-	-	£ 1.089	£ -
PHV	Petrol	Euro 2	1999	-	-	-	£ 1.089	£ -
PHV	Petrol	Euro 3	2004	0.076	1,336,399	101,967	£ 1.089	£ 111,043
PHV	Petrol	Euro 4	2008	0.070	9,800,258	683,078	£ 1.089	£ 743,875
PHV	Petrol	Euro 5	2013	0.056	15,145,853	852,712	£ 1.089	£ 928,607
PHV	Petrol	Euro 6 / Electric	2016	0.054	7,572,926	409,695	£ 1.089	£ 446,160
PHV	Petrol	Euro 6c	2016	0.054	10,245,724	554,294	£ 1.089	£ 603,629
PHV	Petrol	Euro 6d	2016	0.054	-	-	£ 1.089	£ -
PHV	Diesel	Euro 0	0	-	-	-	£ 1.128	£ -
PHV	Diesel	Euro 1	1995	-	-	-	£ 1.128	£ -
PHV	Diesel	Euro 2	1999	-	-	-	£ 1.128	£ -
PHV	Diesel	Euro 3	2004	0.062	1,130,799	69,996	£ 1.128	£ 78,971
PHV	Diesel	Euro 4	2008	0.059	10,177,191	603,507	£ 1.128	£ 680,887
PHV	Diesel	Euro 5	2013	0.049	32,793,170	1,597,027	£ 1.128	£ 1,801,793
PHV	Diesel	Euro 6 / Electric	2016	0.045	-	-	£ 1.128	£ -
PHV	Diesel	Euro 6c	2016	0.045	-	-	£ 1.128	£ -
PHV	Diesel	Euro 6d	2016	0.045	-	-	£ 1.128	£ -

Summary of fuel cost 2021

Vehicle	fuel cost (2018 price)		
	Diesel	Petrol	Difference
Car	£ -	£ -	£ -
PHV	£ 2,561,652	£ 2,833,314	£ 271,662
Total	£ 2,561,652	£ 2,833,314	£ 271,662

Summary of fuel cost saving 2021 to 2030

Vehicle	+ve saving, -ve cost										
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Car	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
PHV	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 2,716,620
Total	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 271,662	-£ 2,716,620

Profiling (non-compliant vehicles)

	Profiling (non-compliant vehicles)									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Car	100%	84%	68%	52%	37%	30%	19%	9%	5%	3%
PHV	100%	78%	57%	35%	13%	11%	8%	4%	2%	2%

	£	£	£	£	£	£	£	£	£	£	£
Car	-	-	-	-	-	-	-	-	-	-	-
PHV	-£ 271,662	-£ 212,869	-£ 154,075	-£ 95,282	-£ 36,488	-£ 30,142	-£ 20,624	-£ 11,105	-£ 6,346	-£ 4,759	-£ 843,352
Total	-£ 271,662	-£ 212,869	-£ 154,075	-£ 95,282	-£ 36,488	-£ 30,142	-£ 20,624	-£ 11,105	-£ 6,346	-£ 4,759	-£ 843,352

Average Age by Euro Standard

Conc	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	27	23	19	14	10	5	2	1
Car Diesel	27	23	19	14	10	5	2	1
PHV Petrol	27	23	19	14	10	5	2	1
PHV Diesel	27	23	19	14	10	5	2	1
Taxi Petrol	27	23	19	14	10	5	2	1
Taxi Diesel	27	23	19	14	10	5	2	1
LGV petrol	25	22	19	14	10	5	2	1
LGV diesel	25	22	19	14	10	5	2	1
HGV	27	23	19	15	11	6	2	1
Buses	27	23	19	15	11	6	2	1
Coach	27	23	19	15	11	6	2	1
Taxi Electric					8	6	2	1
PHV Electric					8	6	2	1

Average residual (depreciated) value of vehicle in each Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	New (Euro 6d)
Car Petrol	86	173	347	829	1,664	3,980	6,714	8,188
Car Diesel	86	173	347	829	1,664	3,980	6,714	8,188
PHV Petrol	86	173	347	829	1,664	3,980	6,714	8,188
PHV Diesel	86	173	347	829	1,664	3,980	6,714	8,188
Taxi Petrol	304	611	1,226	2,933	5,890	14,085	23,764	28,980
Taxi Diesel	304	611	1,226	2,933	5,890	14,085	23,764	28,980
LGV petrol	125	211	355	850	1,707	4,081	6,885	8,397
LGV diesel	125	211	355	850	1,707	4,081	6,885	8,397
HGV	245	542	1,200	2,654	5,870	15,832	35,018	42,705
Bus	597	1,321	2,922	6,463	14,295	38,557	85,280	104,000
Coach	933	2,064	4,566	10,098	22,335	60,245	133,250	162,500

Consumer Welfare Loss - new upgrade

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	New (Euro 6d)
7%	Car Petrol	165	164	163	160	154	139	115	-
9%	Car Diesel	214	213	211	207	200	181	149	-
56%	PHV Petrol	1,336	1,332	1,322	1,297	1,252	1,129	930	-
58%	PHV Diesel	1,385	1,380	1,371	1,344	1,298	1,171	964	-
100%	Taxi Petrol	8,481	8,452	8,393	8,231	7,949	7,169	5,902	-
100%	Taxi Diesel	8,481	8,452	8,393	8,231	7,949	7,169	5,902	-
60%	LGV petrol	1,468	1,463	1,455	1,427	1,378	1,243	1,023	-
60%	LGV diesel	1,468	1,463	1,455	1,427	1,378	1,243	1,023	-
79%	HGV	9,050	9,024	8,967	8,841	8,563	7,700	6,039	-
100%	Bus	27,934	27,855	27,679	27,291	26,431	23,768	18,640	-
100%	Coach	43,648	43,523	43,249	42,642	41,299	37,138	29,125	-

Consumer Welfare Loss - second hand, same fuel type

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
7%	Petrol	Car Petrol	5	4	3	-	-
9%	Diesel	Car Diesel	33	32	31	27	20
56%	Petrol	PHV Petrol	39	35	26	-	-
58%	Diesel	PHV Diesel	214	210	200	173	127
100%	Petrol	Taxi Petrol	250	221	162	-	-
100%	Diesel	Taxi Diesel	1,312	1,283	1,225	1,062	780
60%	Petrol	LGV petrol	41	36	28	-	-
60%	Diesel	LGV diesel	225	221	212	184	135
79%	Diesel	HGV	1,350	1,324	1,267	1,141	863
100%	Diesel	Bus	4,166	4,087	3,911	3,523	2,663
100%	Diesel	Coach	6,510	6,386	6,111	5,504	4,161

Consumer Welfare Loss - second hand, different fuel type (cheapest option)

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
7%	Petrol	Car Petrol	5	4	3	-	-
9%	Diesel	Car Diesel	-	-	-	-	-
56%	Petrol	PHV Petrol	39	35	26	-	-
58%	Diesel	PHV Diesel	-	-	-	-	-
100%	Petrol	Taxi Petrol	250	221	162	-	-
100%	Diesel	Taxi Diesel	-	-	-	-	-
60%	Petrol	LGV petrol	41	36	28	-	-
60%	Diesel	LGV diesel	-	-	-	-	-
79%	Diesel	HGV	-	-	-	-	-
100%	Diesel	Bus	-	-	-	-	-
100%	Diesel	Coach	-	-	-	-	-

Average Age by Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	28	24	20	15	11	6	3	2
Car Diesel	28	24	20	15	11	6	3	2
PHV Petrol	28	24	20	15	11	6	3	2
PHV Diesel	28	24	20	15	11	6	3	2
Taxi Petrol	28	24	20	15	11	6	3	2
Taxi Diesel	28	24	20	15	11	6	3	2
LGV petrol	26	23	20	15	11	6	3	2
LGV diesel	26	23	20	15	11	6	3	2
HGV	28	24	20	16	12	7	3	2
Buses	28	24	20	16	12	7	3	2
Coach	28	24	20	16	12	7	3	2
Taxi Electric					9	7	3	2
PHV Electric					9	7	3	2

Average residual (depreciated) value of vehicle in each Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	72	145	291	696	1,398	3,343	5,640	6,714
Car Diesel	72	145	291	696	1,398	3,343	5,640	6,714
PHV Petrol	72	145	291	696	1,398	3,343	5,640	6,714
PHV Diesel	72	145	291	696	1,398	3,343	5,640	6,714
Taxi Petrol	255	513	1,030	2,463	4,948	11,831	19,961	23,764
Taxi Diesel	255	513	1,030	2,463	4,948	11,831	19,961	23,764
LGV petrol	105	177	298	714	1,434	3,428	5,784	6,885
LGV diesel	105	177	298	714	1,434	3,428	5,784	6,885
HGV	201	445	984	2,176	4,813	12,983	28,715	35,018
Bus	490	1,083	2,396	5,300	11,722	31,617	69,930	85,280
Coach	765	1,693	3,744	8,281	18,315	49,401	109,265	133,250

Consumer Welfare Loss - new upgrade									
Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	New (Euro 6d)
6%	Car Petrol	186	185	183	178	170	145	111	-
11%	Car Diesel	336	335	331	322	306	263	201	-
6%	PHV Petrol	186	185	183	178	170	145	111	-
11%	PHV Diesel	336	335	331	322	306	263	201	-
6%	Taxi Petrol	658	655	649	631	600	515	393	-
11%	Taxi Diesel	1,190	1,184	1,172	1,140	1,085	930	711	-
12%	LGV petrol	383	382	379	368	350	300	229	-
12%	LGV diesel	383	382	379	368	350	300	229	-
5%	HGV	770	767	761	746	714	614	420	-
8%	Bus	3,085	3,073	3,047	2,988	2,859	2,457	1,684	-
8%	Coach	4,821	4,802	4,761	4,669	4,467	3,839	2,631	-

Consumer Welfare Loss - second hand, same fuel type									
Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric		
6%	Petrol	Car Petrol	4	3	2	-	-	-	-
11%	Diesel	Car Diesel	33	33	31	27	20	-	-
6%	Petrol	PHV Petrol	4	3	2	-	-	-	-
11%	Diesel	PHV Diesel	33	33	31	27	20	-	-
6%	Petrol	Taxi Petrol	13	11	8	-	-	-	-
11%	Diesel	Taxi Diesel	119	116	111	96	70	-	-
12%	Petrol	LGV petrol	7	6	5	-	-	-	-
12%	Diesel	LGV diesel	38	37	36	31	23	-	-
5%	Diesel	HGV	71	69	66	60	45	-	-
8%	Diesel	Bus	283	278	266	239	181	-	-
8%	Diesel	Coach	442	434	415	374	283	-	-

Consumer Welfare Loss - second hand, different fuel type (cheapest option)									
Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric		
6%	Petrol	Car Petrol	8	7	5	-	-	-	-
11%	Diesel	Car Diesel	-	-	-	-	-	-	-
6%	Petrol	PHV Petrol	8	7	5	-	-	-	-
11%	Diesel	PHV Diesel	-	-	-	-	-	-	-
6%	Petrol	Taxi Petrol	27	24	18	-	-	-	-
11%	Diesel	Taxi Diesel	-	-	-	-	-	-	-
12%	Petrol	LGV petrol	15	13	10	-	-	-	-
12%	Diesel	LGV diesel	-	-	-	-	-	-	-
5%	Diesel	HGV	-	-	-	-	-	-	-
8%	Diesel	Bus	-	-	-	-	-	-	-
8%	Diesel	Coach	-	-	-	-	-	-	-

2024

Average Age by Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	29	25	21	16	12	7	4	3
Car Diesel	29	25	21	16	12	7	4	3
PHV Petrol	29	25	21	16	12	7	4	3
PHV Diesel	29	25	21	16	12	7	4	3
Taxi Petrol	29	25	21	16	12	7	4	3
Taxi Diesel	29	25	21	16	12	7	4	3
LGV petrol	27	24	21	16	12	7	4	3
LGV diesel	27	24	21	16	12	7	4	3
HGV	29	25	21	17	13	8	4	3
Buses	29	25	21	17	13	8	4	3
Coach	29	25	21	17	13	8	4	3
Taxi Electric					10	8	4	3
PHV Electric					10	8	4	3

Average residual (depreciated) value of vehicle in each Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	61	122	245	585	1,174	2,808	4,738	5,640
Car Diesel	61	122	245	585	1,174	2,808	4,738	5,640
PHV Petrol	61	122	245	585	1,174	2,808	4,738	5,640
PHV Diesel	61	122	245	585	1,174	2,808	4,738	5,640
Taxi Petrol	215	431	865	2,069	4,156	9,938	16,768	19,961
Taxi Diesel	215	431	865	2,069	4,156	9,938	16,768	19,961
LGV petrol	88	149	251	600	1,204	2,879	4,858	5,784
LGV diesel	88	149	251	600	1,204	2,879	4,858	5,784
HGV	165	365	807	1,784	3,947	10,646	23,546	28,715
Bus	402	888	1,965	4,346	9,612	25,926	57,342	69,930
Coach	628	1,388	3,070	6,790	15,018	40,509	89,597	109,265

Consumer Welfare Loss - new upgrade

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	New (Euro 6d)
6%	Car Petrol	218	216	214	207	195	161	116	-
11%	Car Diesel	393	391	387	374	352	292	210	-
6%	PHV Petrol	218	216	214	207	195	161	116	-
11%	PHV Diesel	393	391	387	374	352	292	210	-
6%	Taxi Petrol	770	766	757	732	689	571	411	-
11%	Taxi Diesel	1,392	1,384	1,368	1,323	1,246	1,033	743	-
12%	LGV petrol	448	446	442	427	403	334	240	-
12%	LGV diesel	448	446	442	427	403	334	240	-
5%	HGV	928	924	915	895	851	713	449	-
8%	Bus	3,718	3,701	3,665	3,585	3,407	2,857	1,798	-
8%	Coach	5,809	5,783	5,727	5,601	5,324	4,465	2,810	-

Consumer Welfare Loss - second hand, same fuel type

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric		
6%	Petrol	Car Petrol	3	3	2	-	-	-	-
11%	Diesel	Car Diesel	28	28	26	23	17	-	-
6%	Petrol	PHV Petrol	3	3	2	-	-	-	-
11%	Diesel	PHV Diesel	28	28	26	23	17	-	-
6%	Petrol	Taxi Petrol	11	9	7	-	-	-	-
11%	Diesel	Taxi Diesel	100	97	93	81	59	-	-
12%	Petrol	LGV petrol	6	5	4	-	-	-	-
12%	Diesel	LGV diesel	32	31	30	26	19	-	-
5%	Diesel	HGV	58	57	54	49	37	-	-
8%	Diesel	Bus	232	228	218	196	148	-	-
8%	Diesel	Coach	363	356	340	307	232	-	-

Consumer Welfare Loss - second hand, different fuel type (cheapest option)			Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
6%	Petrol	Car Petrol	11	9	7	-	-	-
11%	Diesel	Car Diesel	-	-	-	-	-	-
6%	Petrol	PHV Petrol	11	9	7	-	-	-
11%	Diesel	PHV Diesel	-	-	-	-	-	-
6%	Petrol	Taxi Petrol	38	33	25	-	-	-
11%	Diesel	Taxi Diesel	18	2	-	-	-	-
12%	Petrol	LGV petrol	21	19	14	-	-	-
12%	Diesel	LGV diesel	-	-	-	-	-	-
5%	Diesel	HGV	-	-	-	-	-	-
8%	Diesel	Bus	-	-	-	-	-	-
8%	Diesel	Coach	-	-	-	-	-	-

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Average Age by Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	30	26	22	17	13	8	5	4
Car Diesel	30	26	22	17	13	8	5	4
PHV Petrol	30	26	22	17	13	8	5	4
PHV Diesel	30	26	22	17	13	8	5	4
Taxi Petrol	30	26	22	17	13	8	5	4
Taxi Diesel	30	26	22	17	13	8	5	4
LGV petrol	28	25	22	17	13	8	5	4
LGV diesel	28	25	22	17	13	8	5	4
HGV	30	26	22	18	14	9	5	4
Buses	30	26	22	18	14	9	5	4
Coach	30	26	22	18	14	9	5	4
Taxi Electric					11	9	5	4
PHV Electric					11	9	5	4

Average residual (depreciated) value of vehicle in each Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	51	102	205	491	986	2,359	3,980	4,738
Car Diesel	51	102	205	491	986	2,359	3,980	4,738
PHV Petrol	51	102	205	491	986	2,359	3,980	4,738
PHV Diesel	51	102	205	491	986	2,359	3,980	4,738
Taxi Petrol	180	362	727	1,738	3,491	8,348	14,085	16,768
Taxi Diesel	180	362	727	1,738	3,491	8,348	14,085	16,768
LGV petrol	74	125	211	504	1,012	2,419	4,081	4,858
LGV diesel	74	125	211	504	1,012	2,419	4,081	4,858
HGV	135	299	662	1,463	3,236	8,730	19,308	23,546
Bus	329	728	1,611	3,563	7,882	21,259	47,021	57,342
Coach	515	1,138	2,517	5,568	12,315	33,217	73,470	89,597

Consumer Welfare Loss - new upgrade

Upgrade	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	New (Euro 6d)
6%	244	243	239	231	216	175	120	-
11%	441	439	433	417	391	316	218	-
6%	244	243	239	231	216	175	120	-
11%	441	439	433	417	391	316	218	-
6%	864	859	848	817	765	619	426	-
11%	1,562	1,552	1,532	1,477	1,382	1,119	771	-
12%	503	500	495	477	446	361	249	-
12%	503	500	495	477	446	361	249	-
5%	1,058	1,053	1,042	1,017	963	795	472	-
8%	4,236	4,216	4,172	4,074	3,857	3,185	1,892	-
8%	6,619	6,588	6,518	6,365	6,027	4,977	2,957	-

Consumer Welfare Loss - second hand, same fuel type

Upgrade	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
6%	2	2	2	-	-	-
11%	24	23	22	19	14	-
6%	2	2	2	-	-	-
11%	24	23	22	19	14	-
6%	9	8	6	-	-	-
11%	84	82	78	68	50	-
12%	5	4	3	-	-	-
12%	27	26	25	22	16	-
5%	48	47	45	40	30	-
8%	190	187	179	161	122	-
8%	297	292	279	251	190	-

Consumer Welfare Loss - second hand, different fuel type (cheapest option)

Upgrade	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
6%	13	12	9	-	-	-
11%	-	-	-	-	-	-
6%	13	12	9	-	-	-
11%	-	-	-	-	-	-
6%	47	41	30	-	-	-
11%	42	25	-	-	-	-
12%	26	23	18	-	-	-
12%	-	-	-	-	-	-
5%	-	-	-	-	-	-
8%	-	-	-	-	-	-
8%	-	-	-	-	-	-

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Average Age by Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	31	27	23	18	14	9	6	5
Car Diesel	31	27	23	18	14	9	6	5
PHV Petrol	31	27	23	18	14	9	6	5
PHV Diesel	31	27	23	18	14	9	6	5
Taxi Petrol	31	27	23	18	14	9	6	5
Taxi Diesel	31	27	23	18	14	9	6	5
LGV petrol	29	26	23	18	14	9	6	5
LGV diesel	29	26	23	18	14	9	6	5
HGV	31	27	23	19	15	10	6	5
Buses	31	27	23	19	15	10	6	5
Coach	31	27	23	19	15	10	6	5
Taxi Electric					12	10	6	5
PHV Electric					12	10	6	5

Average residual (depreciated) value of vehicle in each Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	43	86	173	413	829	1,981	3,343	3,980
Car Diesel	43	86	173	413	829	1,981	3,343	3,980
PHV Petrol	43	86	173	413	829	1,981	3,343	3,980
PHV Diesel	43	86	173	413	829	1,981	3,343	3,980
Taxi Petrol	151	304	611	1,460	2,933	7,012	11,831	14,085
Taxi Diesel	151	304	611	1,460	2,933	7,012	11,831	14,085
LGV petrol	62	105	177	423	850	2,032	3,428	4,081
LGV diesel	62	105	177	423	850	2,032	3,428	4,081
HGV	111	245	542	1,200	2,654	7,158	15,832	19,308
Bus	270	597	1,321	2,922	6,463	17,432	38,557	47,021
Coach	422	933	2,064	4,566	10,098	27,238	60,245	73,470

Consumer Welfare Loss - new upgrade

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	New (Euro 6d)
6%	Car Petrol	266	265	261	251	234	186	124	-
11%	Car Diesel	482	478	472	454	423	337	224	-
6%	PHV Petrol	266	265	261	251	234	186	124	-
11%	PHV Diesel	482	478	472	454	423	337	224	-
6%	Taxi Petrol	943	937	924	889	828	659	439	-
11%	Taxi Diesel	1,705	1,693	1,670	1,607	1,497	1,191	794	-
12%	LGV petrol	549	545	539	519	483	385	256	-
12%	LGV diesel	549	545	539	519	483	385	256	-
5%	HGV	1,164	1,158	1,145	1,117	1,055	863	492	-
8%	Bus	4,661	4,638	4,587	4,475	4,226	3,455	1,969	-
8%	Coach	7,283	7,247	7,168	6,992	6,603	5,398	3,077	-

Consumer Welfare Loss - second hand, same fuel type

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
6%	Petrol	Car Petrol	2	2	1	-	-
11%	Diesel	Car Diesel	20	19	19	16	12
6%	Petrol	PHV Petrol	2	2	1	-	-
11%	Diesel	PHV Diesel	20	19	19	16	12
6%	Petrol	Taxi Petrol	7	7	5	-	-
11%	Diesel	Taxi Diesel	70	69	66	57	42
12%	Petrol	LGV petrol	4	4	3	-	-
12%	Diesel	LGV diesel	22	22	21	18	13
5%	Diesel	HGV	39	38	37	33	25
8%	Diesel	Bus	156	153	147	132	100
8%	Diesel	Coach	244	239	229	206	156

Consumer Welfare Loss - second hand, different fuel type (cheapest option)

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
6%	Petrol	Car Petrol	15	14	10	-	-
11%	Diesel	Car Diesel	-	-	-	-	-
6%	Petrol	PHV Petrol	15	14	10	-	-
11%	Diesel	PHV Diesel	-	-	-	-	-
6%	Petrol	Taxi Petrol	54	48	35	-	-
11%	Diesel	Taxi Diesel	62	45	9	-	-
12%	Petrol	LGV petrol	30	27	21	-	-
12%	Diesel	LGV diesel	-	-	-	-	-
5%	Diesel	HGV	-	-	-	-	-
8%	Diesel	Bus	-	-	-	-	-
8%	Diesel	Coach	-	-	-	-	-

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Average Age by Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	32	28	24	19	15	10	7	6
Car Diesel	32	28	24	19	15	10	7	6
PHV Petrol	32	28	24	19	15	10	7	6
PHV Diesel	32	28	24	19	15	10	7	6
Taxi Petrol	32	28	24	19	15	10	7	6
Taxi Diesel	32	28	24	19	15	10	7	6
LGV petrol	30	27	24	19	15	10	7	6
LGV diesel	30	27	24	19	15	10	7	6
HGV	32	28	24	20	16	11	7	6
Buses	32	28	24	20	16	11	7	6
Coach	32	28	24	20	16	11	7	6
Taxi Electric					13	11	7	6
PHV Electric					13	11	7	6

Average residual (depreciated) value of vehicle in each Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	36	72	145	347	696	1,664	2,808	3,343
Car Diesel	36	72	145	347	696	1,664	2,808	3,343
PHV Petrol	36	72	145	347	696	1,664	2,808	3,343
PHV Diesel	36	72	145	347	696	1,664	2,808	3,343
Taxi Petrol	127	255	513	1,226	2,463	5,890	9,938	11,831
Taxi Diesel	127	255	513	1,226	2,463	5,890	9,938	11,831
LGV petrol	52	88	149	355	714	1,707	2,879	3,428
LGV diesel	52	88	149	355	714	1,707	2,879	3,428
HGV	91	201	445	984	2,176	5,870	12,983	15,832
Bus	221	490	1,083	2,396	5,300	14,295	31,617	38,557
Coach	346	765	1,693	3,744	8,281	22,335	49,401	60,245

Consumer Welfare Loss - new upgrade

Upgrade	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	New (Euro 6d)
7%	322	320	315	303	281	221	144	-
7%	333	331	326	313	291	229	149	-
7%	322	320	315	303	281	221	144	-
7%	333	331	326	313	291	229	149	-
7%	1,140	1,132	1,116	1,072	995	782	508	-
7%	1,179	1,171	1,155	1,109	1,030	810	526	-
6%	283	281	278	267	248	195	126	-
6%	283	281	278	267	248	195	126	-
1%	352	350	346	338	318	258	143	-
1%	663	660	652	636	599	486	269	-
1%	1,036	1,031	1,019	993	936	760	420	-

Consumer Welfare Loss - second hand, same fuel type

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
7%	Petrol	Car Petrol	2	2	1	-	-
7%	Diesel	Car Diesel	11	11	10	9	6
7%	Petrol	PHV Petrol	2	2	1	-	-
7%	Diesel	PHV Diesel	11	11	10	9	6
7%	Petrol	Taxi Petrol	7	6	5	-	-
7%	Diesel	Taxi Diesel	38	37	36	31	23
6%	Petrol	LGV petrol	2	1	1	-	-
6%	Diesel	LGV diesel	9	9	9	7	5
1%	Diesel	HGV	9	9	8	8	6
1%	Diesel	Bus	17	17	16	14	11
1%	Diesel	Coach	26	26	25	22	17

Consumer Welfare Loss - second hand, different fuel type (cheapest option)

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
7%	Petrol	Car Petrol	19	17	13	-	-
7%	Diesel	Car Diesel	-	-	-	-	-
7%	Petrol	PHV Petrol	19	17	13	-	-
7%	Diesel	PHV Diesel	-	-	-	-	-
7%	Petrol	Taxi Petrol	68	60	44	-	-
7%	Diesel	Taxi Diesel	51	40	16	-	-
6%	Petrol	LGV petrol	16	14	11	-	-
6%	Diesel	LGV diesel	-	-	-	-	-
1%	Diesel	HGV	-	-	-	-	-
1%	Diesel	Bus	-	-	-	-	-
1%	Diesel	Coach	-	-	-	-	-

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Average Age by Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	33	29	25	20	16	11	8	7
Car Diesel	33	29	25	20	16	11	8	7
PHV Petrol	33	29	25	20	16	11	8	7
PHV Diesel	33	29	25	20	16	11	8	7
Taxi Petrol	33	29	25	20	16	11	8	7
Taxi Diesel	33	29	25	20	16	11	8	7
LGV petrol	31	28	25	20	16	11	8	7
LGV diesel	31	28	25	20	16	11	8	7
HGV	33	29	25	21	17	12	8	7
Buses	33	29	25	21	17	12	8	7
Coach	33	29	25	21	17	12	8	7
Taxi Electric					14	12	8	7
PHV Electric					14	12	8	7

Average residual (depreciated) value of vehicle in each Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	30	61	122	291	585	1,398	2,359	2,808
Car Diesel	30	61	122	291	585	1,398	2,359	2,808
PHV Petrol	30	61	122	291	585	1,398	2,359	2,808
PHV Diesel	30	61	122	291	585	1,398	2,359	2,808
Taxi Petrol	107	215	431	1,030	2,069	4,948	8,348	9,938
Taxi Diesel	107	215	431	1,030	2,069	4,948	8,348	9,938
LGV petrol	44	74	125	298	600	1,434	2,419	2,879
LGV diesel	44	74	125	298	600	1,434	2,419	2,879
HGV	75	165	365	807	1,784	4,813	10,646	12,983
Bus	182	402	888	1,965	4,346	11,722	25,926	31,617
Coach	284	628	1,388	3,070	6,790	18,315	40,509	49,401

Consumer Welfare Loss - new upgrade

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	New (Euro 6d)
11%	Car Petrol	544	540	532	510	473	368	234	-
11%	Car Diesel	563	559	550	528	489	381	242	-
11%	PHV Petrol	544	540	532	510	473	368	234	-
11%	PHV Diesel	563	559	550	528	489	381	242	-
11%	Taxi Petrol	1,925	1,911	1,883	1,806	1,673	1,303	829	-
11%	Taxi Diesel	1,991	1,977	1,948	1,869	1,731	1,348	858	-
9%	LGV petrol	477	474	468	449	416	324	206	-
9%	LGV diesel	477	474	468	449	416	324	206	-
2%	HGV	595	592	585	570	537	434	234	-
2%	Bus	1,121	1,116	1,103	1,074	1,011	817	441	-
2%	Coach	1,752	1,743	1,723	1,678	1,580	1,276	690	-

Consumer Welfare Loss - second hand, same fuel type

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
11%	Petrol	Car Petrol	3	2	2	-	-
11%	Diesel	Car Diesel	14	14	14	12	9
11%	Petrol	PHV Petrol	3	2	2	-	-
11%	Diesel	PHV Diesel	14	14	14	12	9
11%	Petrol	Taxi Petrol	9	8	6	-	-
11%	Diesel	Taxi Diesel	51	50	48	41	30
9%	Petrol	LGV petrol	2	2	2	-	-
9%	Diesel	LGV diesel	12	12	12	10	7
2%	Diesel	HGV	12	12	11	10	8
2%	Diesel	Bus	22	22	21	19	14
2%	Diesel	Coach	35	34	33	29	22

Consumer Welfare Loss - second hand, different fuel type (cheapest option)

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
11%	Petrol	Car Petrol	34	30	22	-	-
11%	Diesel	Car Diesel	-	-	-	-	-
11%	Petrol	PHV Petrol	34	30	22	-	-
11%	Diesel	PHV Diesel	-	-	-	-	-
11%	Petrol	Taxi Petrol	119	105	77	-	-
11%	Diesel	Taxi Diesel	97	78	40	-	-
9%	Petrol	LGV petrol	28	25	19	-	-
9%	Diesel	LGV diesel	-	-	-	-	-
2%	Diesel	HGV	-	-	-	-	-
2%	Diesel	Bus	-	-	-	-	-
2%	Diesel	Coach	-	-	-	-	-

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Average Age by Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	34	30	26	21	17	12	9	8
Car Diesel	34	30	26	21	17	12	9	8
PHV Petrol	34	30	26	21	17	12	9	8
PHV Diesel	34	30	26	21	17	12	9	8
Taxi Petrol	34	30	26	21	17	12	9	8
Taxi Diesel	34	30	26	21	17	12	9	8
LGV petrol	32	29	26	21	17	12	9	8
LGV diesel	32	29	26	21	17	12	9	8
HGV	34	30	26	22	18	13	9	8
Buses	34	30	26	22	18	13	9	8
Coach	34	30	26	22	18	13	9	8
Taxi Electric					15	13	9	8
PHV Electric					15	13	9	8

Average residual (depreciated) value of vehicle in each Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	25	51	102	245	491	1,174	1,981	2,359
Car Diesel	25	51	102	245	491	1,174	1,981	2,359
PHV Petrol	25	51	102	245	491	1,174	1,981	2,359
PHV Diesel	25	51	102	245	491	1,174	1,981	2,359
Taxi Petrol	90	180	362	865	1,738	4,156	7,012	8,348
Taxi Diesel	90	180	362	865	1,738	4,156	7,012	8,348
LGV petrol	37	62	105	251	504	1,204	2,032	2,419
LGV diesel	37	62	105	251	504	1,204	2,032	2,419
HGV	61	135	299	662	1,463	3,947	8,730	10,646
Bus	149	329	728	1,611	3,563	9,612	21,259	25,926
Coach	233	515	1,138	2,517	5,568	15,018	33,217	40,509

Consumer Welfare Loss - new upgrade

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	New (Euro 6d)
10%	Car Petrol	511	507	500	479	443	342	214	-
10%	Car Diesel	529	525	517	495	458	354	222	-
10%	PHV Petrol	511	507	500	479	443	342	214	-
10%	PHV Diesel	529	525	517	495	458	354	222	-
10%	Taxi Petrol	1,808	1,795	1,768	1,694	1,566	1,211	759	-
10%	Taxi Diesel	1,871	1,857	1,830	1,753	1,621	1,253	785	-
8%	LGV petrol	448	445	440	421	390	301	189	-
8%	LGV diesel	448	445	440	421	390	301	189	-
2%	HGV	560	557	550	536	504	405	215	-
2%	Bus	1,054	1,048	1,036	1,009	949	763	405	-
2%	Coach	1,647	1,638	1,619	1,576	1,483	1,192	633	-

Consumer Welfare Loss - second hand, same fuel type

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	New (Euro 6d)
10%	Petrol	Car Petrol	2	2	1	-	-	-	-
10%	Diesel	Car Diesel	11	11	10	9	7	-	-
10%	Petrol	PHV Petrol	2	2	1	-	-	-	-
10%	Diesel	PHV Diesel	11	11	10	9	7	-	-
10%	Petrol	Taxi Petrol	7	6	5	-	-	-	-
10%	Diesel	Taxi Diesel	39	38	36	31	23	-	-
8%	Petrol	LGV petrol	2	1	1	-	-	-	-
8%	Diesel	LGV diesel	9	9	9	8	6	-	-
2%	Diesel	HGV	9	9	8	7	6	-	-
2%	Diesel	Bus	16	16	15	14	10	-	-
2%	Diesel	Coach	26	25	24	22	16	-	-

Consumer Welfare Loss - second hand, different fuel type (cheapest option)

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6 / Electric	Euro 6 / Electric
10%	Petrol	Car Petrol	32	28	21	-	-	-	-
10%	Diesel	Car Diesel	-	-	-	-	-	-	-
10%	Petrol	PHV Petrol	32	28	21	-	-	-	-
10%	Diesel	PHV Diesel	-	-	-	-	-	-	-
10%	Petrol	Taxi Petrol	114	101	74	-	-	-	-
10%	Diesel	Taxi Diesel	98	81	47	-	-	-	-
8%	Petrol	LGV petrol	27	24	18	-	-	-	-
8%	Diesel	LGV diesel	-	-	-	-	-	-	-
2%	Diesel	HGV	-	-	-	-	-	-	-
2%	Diesel	Bus	-	-	-	-	-	-	-
2%	Diesel	Coach	-	-	-	-	-	-	-

Average Age by Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	35	31	27	22	18	13	10	9
Car Diesel	35	31	27	22	18	13	10	9
PHV Petrol	35	31	27	22	18	13	10	9
PHV Diesel	35	31	27	22	18	13	10	9
Taxi Petrol	35	31	27	22	18	13	10	9
Taxi Diesel	35	31	27	22	18	13	10	9
LGV petrol	33	30	27	22	18	13	10	9
LGV diesel	33	30	27	22	18	13	10	9
HGV	35	31	27	23	19	14	10	9
Buses	35	31	27	23	19	14	10	9
Coach	35	31	27	23	19	14	10	9
Taxi Electric					16	14	10	9
PHV Electric					16	14	10	9

Average residual (depreciated) value of vehicle in each Euro Standard

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	21	43	86	205	413	986	1,664	1,981
Car Diesel	21	43	86	205	413	986	1,664	1,981
PHV Petrol	21	43	86	205	413	986	1,664	1,981
PHV Diesel	21	43	86	205	413	986	1,664	1,981
Taxi Petrol	75	151	304	727	1,460	3,491	5,890	7,012
Taxi Diesel	75	151	304	727	1,460	3,491	5,890	7,012
LGV petrol	31	52	88	211	423	1,012	1,707	2,032
LGV diesel	31	52	88	211	423	1,012	1,707	2,032
HGV	50	111	245	542	1,200	3,236	7,158	8,730
Bus	122	270	597	1,321	2,922	7,882	17,432	21,259
Coach	191	422	933	2,064	4,566	12,315	27,238	33,217

Consumer Welfare Loss - new upgrade

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	New (Euro 6d)
5%	Car Petrol	282	280	276	264	244	187	116	-
5%	Car Diesel	292	290	285	273	252	194	120	-
5%	PHV Petrol	282	280	276	264	244	187	116	-
5%	PHV Diesel	292	290	285	273	252	194	120	-
5%	Taxi Petrol	999	991	976	935	863	663	410	-
5%	Taxi Diesel	1,033	1,025	1,010	967	893	686	424	-
4%	LGV petrol	248	246	243	232	215	165	102	-
4%	LGV diesel	248	246	243	232	215	165	102	-
1%	HGV	309	307	304	296	278	223	117	-
2%	Bus	1,091	1,085	1,072	1,043	981	786	412	-
2%	Coach	1,704	1,695	1,675	1,630	1,532	1,229	644	-

Consumer Welfare Loss - second hand, same fuel type

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
5%	Petrol	Car Petrol	1	1	1	-	-
5%	Diesel	Car Diesel	5	5	5	4	3
5%	Petrol	PHV Petrol	1	1	1	-	-
5%	Diesel	PHV Diesel	5	5	5	4	3
5%	Petrol	Taxi Petrol	3	3	2	-	-
5%	Diesel	Taxi Diesel	17	17	16	14	10
4%	Petrol	LGV petrol	1	1	1	-	-
4%	Diesel	LGV diesel	4	4	4	3	2
1%	Diesel	HGV	4	4	4	3	2
2%	Diesel	Bus	13	13	13	11	9
2%	Diesel	Coach	21	21	20	18	13

Consumer Welfare Loss - second hand, different fuel type (cheapest option)

Upgrade		Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric
5%	Petrol	Car Petrol	18	16	12	-	-
5%	Diesel	Car Diesel	-	-	-	-	-
5%	Petrol	PHV Petrol	18	16	12	-	-
5%	Diesel	PHV Diesel	-	-	-	-	-
5%	Petrol	Taxi Petrol	64	56	41	-	-
5%	Diesel	Taxi Diesel	57	48	30	-	-
4%	Petrol	LGV petrol	15	13	10	-	-
4%	Diesel	LGV diesel	-	-	-	-	-
1%	Diesel	HGV	-	-	-	-	-
2%	Diesel	Bus	-	-	-	-	-
2%	Diesel	Coach	-	-	-	-	-

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All Year Average

Consumer Welfare Loss - new upgrade

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6	Euro 6c	New (Euro 6d)
Car Petrol	2,738	2,720	2,684	2,583	2,409	1,926	1,295	-
Car Diesel	3,582	3,559	3,513	3,385	3,162	2,546	1,734	-
PHV Petrol	3,909	3,887	3,843	3,720	3,507	2,916	2,110	-
PHV Diesel	4,754	4,727	4,672	4,521	4,260	3,536	2,549	-
Taxi Petrol	17,588	17,497	17,314	16,807	15,928	13,493	10,078	-
Taxi Diesel	20,404	20,296	20,078	19,476	18,432	15,539	11,514	-
LGV petrol	4,808	4,782	4,738	4,588	4,328	3,608	2,621	-
LGV diesel	4,808	4,782	4,738	4,588	4,328	3,608	2,621	-
HGV	14,786	14,733	14,615	14,356	13,782	12,005	8,581	-
Bus	47,564	47,392	47,013	46,175	44,320	38,575	27,511	-
Coach	74,318	74,051	73,458	72,148	69,250	60,274	42,986	-

Consumer Welfare Loss - second hand, same fuel type

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6	Euro 6c	New (Euro 6d)
Car Petrol	24	21	15	-	-	-	-	-
Car Diesel	179	175	167	145	107	-	-	-
PHV Petrol	58	51	38	-	-	-	-	-
PHV Diesel	361	353	336	292	214	-	-	-
Taxi Petrol	316	280	205	-	-	-	-	-
Taxi Diesel	1,830	1,789	1,708	1,481	1,088	-	-	-
LGV petrol	69	61	47	-	-	-	-	-
LGV diesel	379	371	357	310	228	-	-	-
HGV	1,598	1,568	1,500	1,351	1,021	-	-	-
Bus	5,097	5,000	4,785	4,309	3,258	-	-	-
Coach	7,964	7,812	7,476	6,733	5,090	-	-	-

Consumer Welfare Loss - second hand, different fuel type (cheapest option)

	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6	Euro 6c	New (Euro 6d)
Car Petrol	155	137	100	-	-	-	-	-
Car Diesel	-	-	-	-	-	-	-	-
PHV Petrol	189	167	123	-	-	-	-	-
PHV Diesel	-	-	-	-	-	-	-	-
Taxi Petrol	781	690	507	-	-	-	-	-
Taxi Diesel	426	319	142	-	-	-	-	-
LGV petrol	220	194	150	-	-	-	-	-
LGV diesel	-	-	-	-	-	-	-	-
HGV	-	-	-	-	-	-	-	-
Bus	-	-	-	-	-	-	-	-
Coach	-	-	-	-	-	-	-	-

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Loss of Asset Value

This sheet calculate the loss of asset value as a result of induced early upgrade of compliant vehicles post-intervention. The clean air credit scheme requires the applicant to scrap the older vehicle.

Assumptions

1)The depreciation of the fleet is assumed to start from 2019, so in 2021 a 2 years depreciation will be considered

Total number of vehicles upgrading

Euro Class	Car				Taxi			PHV				LGV			HGV			Bus			
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	158	-	-	8	25	-	-	-	-	-	240	-	-	43	-
4	-	-	-	-	-	-	603	-	-	225	-	-	-	5,904	-	-	480	-	-	43	-
5	-	-	-	-	-	-	289	-	-	725	-	-	-	10,234	-	-	2,761	-	-	490	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-total	-	-	-	-	-	-	1,064	-	-	8	974	-	-	-	-	16,139	-	-	3,481	-	-
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total			
					1,064			983				16,139			3,481			577			

Average residual (depreciated) value of vehicle in each Euro Standard

	0	1	2	3	4	5	6	6c	6d
	Euro 0	Euro 1	Euro 2	Euro 3	Euro 4	Euro 5	Euro 6 / Electric	Euro 6c	Euro 6d
Car Petrol	72	72	145	291	696	1,398	3,343	5,640	6,714
Car Diesel	72	72	145	291	696	1,398	3,343	5,640	6,714
PHV Petrol	72	72	145	291	696	1,398	3,343	5,640	6,714
PHV Diesel	72	72	145	291	696	1,398	3,343	5,640	6,714
Taxi Petrol	255	255	513	1,030	2,463	4,948	11,831	19,961	23,764
Taxi Diesel	255	255	513	1,030	2,463	4,948	11,831	19,961	23,764
LGV petrol	105	105	177	298	714	1,434	3,428	5,784	6,885
LGV diesel	105	105	177	298	714	1,434	3,428	5,784	6,885
HGV	201	201	445	984	2,176	4,813	12,983	28,715	35,018
Bus	490	490	1,083	2,396	5,300	11,722	31,617	69,930	85,280
Coach	765	765	1,693	3,744	8,281	18,315	49,401	109,265	133,250

Total loss of residual value

Euro Class	Car				Taxi			PHV				LGV			HGV			Bus			
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	7,211	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	163,109	-	-	2,382	7,272	-	-	-	-	-	236,189	-	-	103,689	-
4	-	-	-	-	-	-	1,484,770	-	-	-	156,503	-	-	4,214,252	-	-	1,044,802	-	-	229,338	-
5	-	-	-	-	-	-	1,427,601	-	-	-	1,012,888	-	-	14,671,871	-	-	13,287,600	-	-	#####	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-total	-	-	-	-	-	-	3,082,692	-	-	2,382	1,176,664	-	-	18,886,123	-	-	14,568,591	-	-	#####	-
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total			
					3,082,692			1,179,046				18,886,123			14,568,591			6081848			

2018 prices (undiscounted)	2,021	Total
Car Petrol	-	-
Car Diesel	-	-
Car Electric	-	-
Car Other	-	-
Taxi Diesel	3,082,692	3,082,692
PHV Petrol	2,382	2,382
PHV Diesel	1,176,664	1,176,664
PHV Electric	-	-
PHV Other	-	-
LGV Diesel	18,886,123	18,886,123
HGV	14,568,591	14,568,591
Bus	6,081,848	6,081,848
Coach	-	-
Total	43,798,300	43,798,300

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Total transaction costs

This worksheet presents the costs associated with search for vehicle upgrades

Assumptions

1) Euro 6, 6c and 6d transaction cost is assumed to be the same as euro 5

	1	2	3
	Weighted Transaction Costs		
Euro Standard	Car	LGV	HGV
Euro 5	£5.77	£10.13	£6.71
Euro 4	£3.40	£7.89	£7.70
Euro 3	£3.38	£9.65	£6.67
Euro 2	£6.07	£12.17	£5.58
Euro 1	£6.07	£12.17	£5.58

Source: Transaction costs-National data inputs for Local Economic Models

Number of vehicles upgraded by Euro Class

Euro Class	Car				Taxi			PHV				LGV			HGV			Bus				
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other		
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	-	-	-	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	-	-	-	-	-	-	317	-	16	50	-	-	-	-	-	-	480	-	-	87	-	
4	-	-	-	-	-	-	1,205	-	-	450	-	-	-	-	-	-	960	-	-	87	-	
5	-	-	-	-	-	-	577	-	-	1,449	-	-	-	-	-	-	5,521	-	-	981	-	
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub-total	-	-	-	-	-	-	2,127	-	16	1,949	-	-	-	-	-	-	6,962	-	-	1,154	-	
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total			1153.9955	12,208

Total transaction costs

Euro Class	Car				Taxi			PHV				LGV			HGV			Bus				
	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Electric	Other	Petrol	Diesel	Other	Petrol	Diesel	Other	Petrol	Diesel	Other		
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	-	-	-	-	-	-	171	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	-	-	-	-	-	-	1,070	-	55	169	-	-	-	-	-	-	3,202	-	-	577	-	
4	-	-	-	-	-	-	4,094	-	-	1,527	-	-	-	-	-	-	7,397	-	-	667	-	
5	-	-	-	-	-	-	3,330	-	-	8,361	-	-	-	-	-	-	37,055	-	-	6,583	-	
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub-total	-	-	-	-	-	-	8,665	-	55	10,058	-	-	-	-	-	-	47,655	-	-	7,827	-	
Total	Car Total				Taxi Total			PHV Total				LGV Total			HGV Total			Bus Total			7827.1364	74,260

2021 prices	2021	Total
Car Petrol	-	-
Car Diesel	-	-
Car Electric	-	-
Car Other	-	-
Taxi Diesel	8,665	8,664.69
PHV Petrol	55	55.31
PHV Diesel	10,058	10,057.64
PHV Electric	-	-
PHV Other	-	-
LGV Diesel	-	-
HGV	47,655	47,655.16
Bus	7,827	7,827.14
Coach	-	-
Total	74,260	74,260

2018 prices (undiscounted)	2021	Total
Car Petrol	-	-
Car Diesel	-	-
Car Electric	-	-
Car Other	-	-
Taxi Diesel	8,253	8,252.66
PHV Petrol	53	52.68
PHV Diesel	9,579	9,579.37
PHV Electric	-	-
PHV Other	-	-
LGV Diesel	-	-
HGV	45,389	45,389.07
Bus	7,455	7,454.94
Coach	-	-
Total	70,729	70,729

Summary of Vehicle Upgrade

This worksheet presents the summary of the vehicle upgrades

Undiscounted 2018 prices	Car	LGV	HGV	PHV	Taxi	Bus	Total
Number of Vehicles Upgrading	-	32,277	6,962	1,965	2,127	1,154	44,485
of which are scrapping	-	32,277	6,962	1,965	2,127	87	43,418
of which are retrofitting						1,067	1,067
Welfare Loss of Upgrading	-	35,480,651	24,440,269	2,107,623	10,337,913	12,983,279	85,349,735
Welfare Loss of Retrofitting						10,674,458	10,674,458
Transaction Cost	-	-	45,389	9,632	8,253	7,455	70,729
Loss of Asset Value	-	18,886,123	14,568,591	1,179,046	3,082,692	6,081,848	43,798,300
Fuel Switch Cost	-			843,352			843,352
Total							140,736,574

Proportion of non-compliant vehicles upgrading

Vehicle Type	Vehicles upgrading
Car	0%
Taxi	100%
PHV	49%
LGV	49%
HGV	75%
Bus	100%
Coach	100%

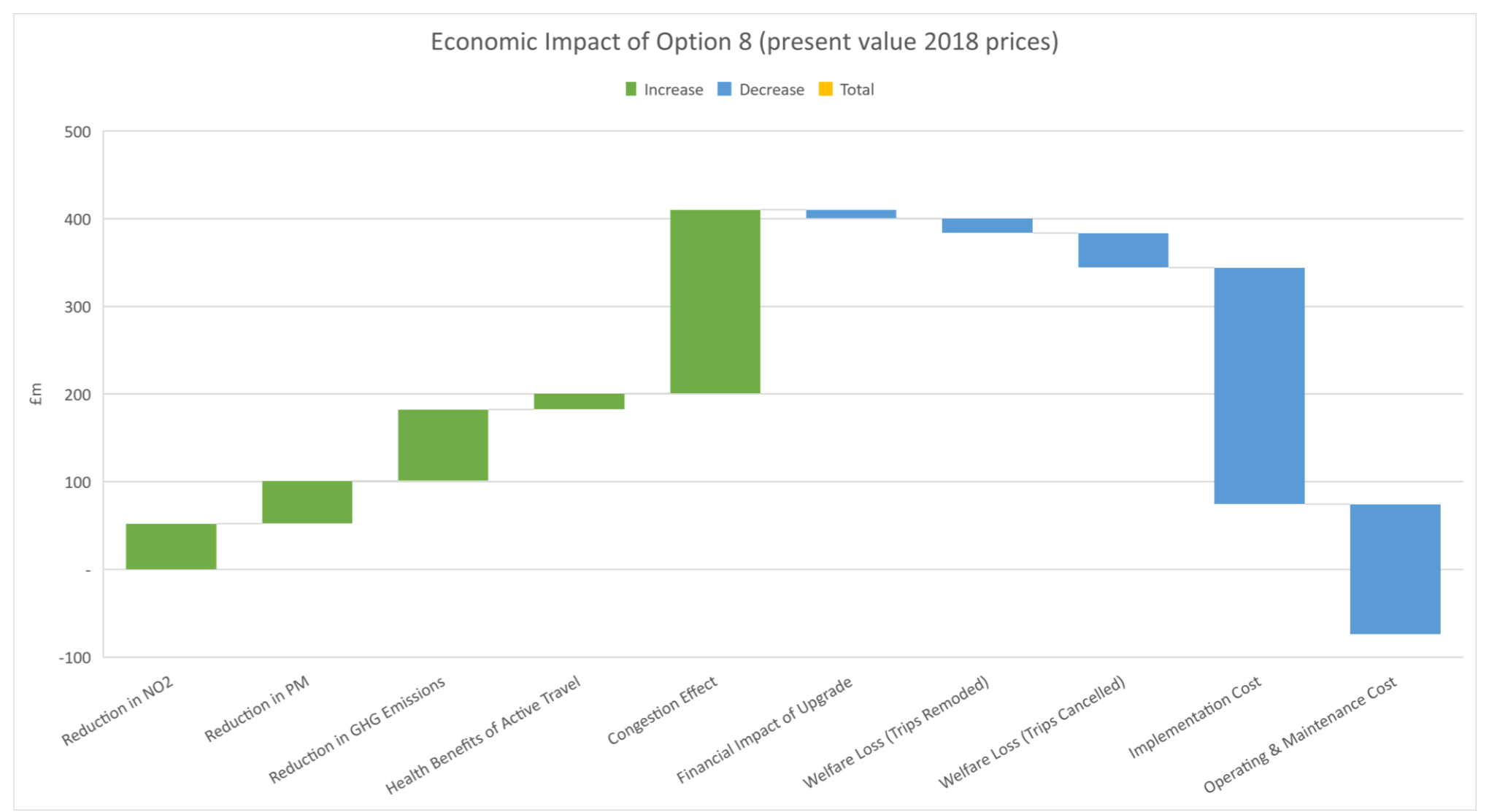
Summary of CBA

This worksheet summarises the costs and benefits of the CAP, presenting the Net Present Value

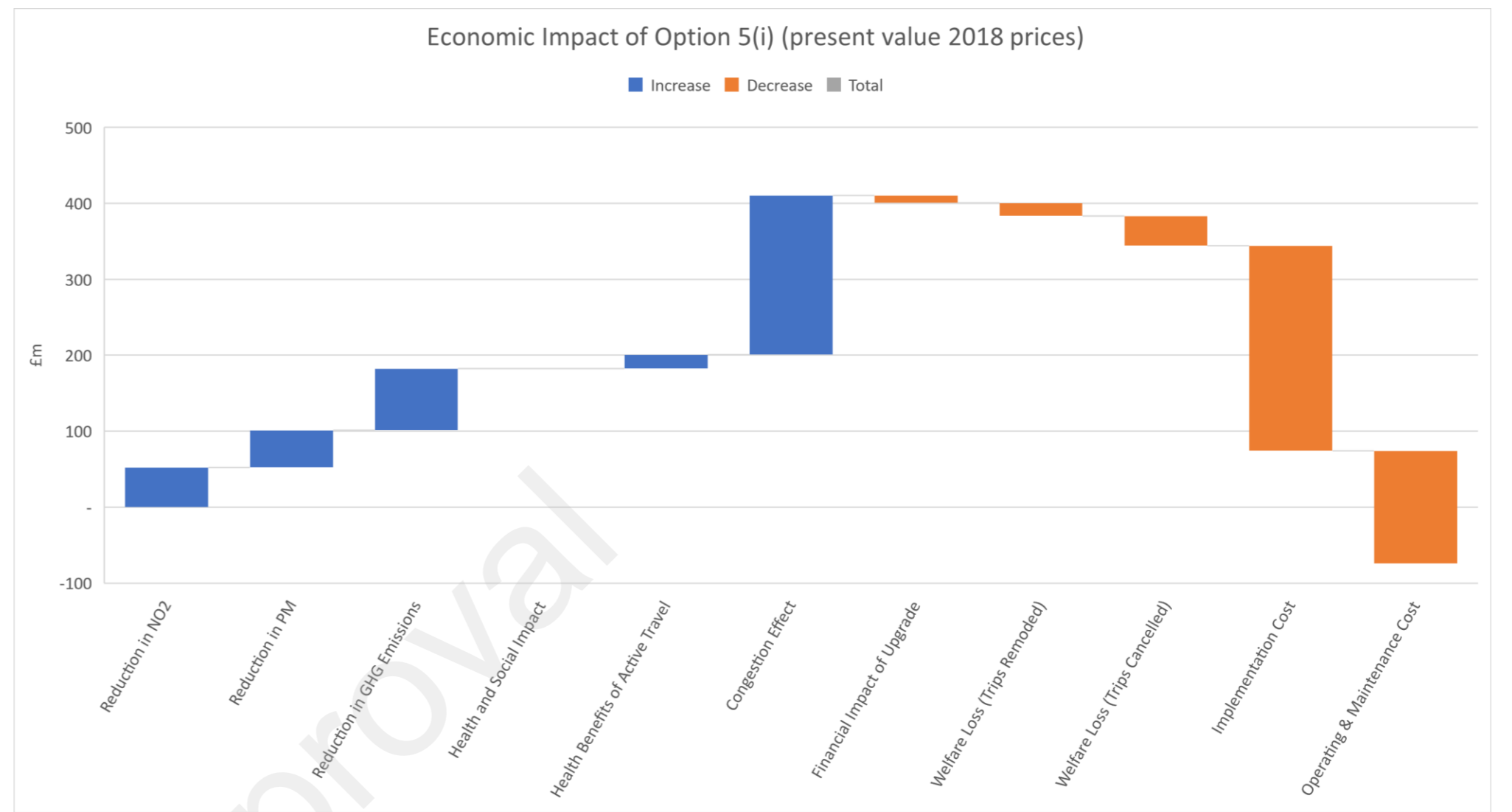
Discounted 2018 prices	Total	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Impact to Transport Users (+ve indicates benefit, -ve indicates disbenefits)													
Financial cost to upgrade	- 86,608,321	-	-	86,608,321	-	-	-	-	-	-	-	-	-
Financial subsidy (vehicle upgrades)	116,735,995	13,696,235	43,192,134	37,864,555	21,983,071	-	-	-	-	-	-	-	-
Loss of asset value	- 39,503,558	-	-	39,503,558	-	-	-	-	-	-	-	-	-
Transaction cost	- 63,793	-	-	63,793	-	-	-	-	-	-	-	-	-
Travel time savings	136,253,473	-	-	14,480,417	14,098,080	13,800,385	13,519,606	13,259,154	13,295,508	13,344,920	13,408,338	13,483,022	13,564,044
Vehicle operating cost	- 73,474,225	-	-	6,019,206	6,515,192	7,018,978	7,508,288	7,990,060	7,886,010	7,782,451	7,677,826	7,585,367	7,490,848
Fuel switch costs	- 719,836	-	-	245,024	185,503	129,727	77,512	28,679	22,890	15,132	7,873	4,347	3,150
Charge Payments	- 233,978,982	-	-	49,009,556	37,908,849	51,380,577	36,773,504	23,608,700	18,348,348	11,339,707	5,609,740	-	-
Welfare Loss (cancelled trips)	- 39,193,323	-	-	6,588,431	5,175,656	8,847,165	6,603,197	4,533,516	3,551,543	2,130,843	1,007,001	442,367	313,603
Welfare Loss (re-mode)	- 16,774,791	-	-	-	-	5,027,148	3,944,650	2,920,468	2,300,806	1,392,095	658,033	311,047	220,545
Sub-total	- 90,378,911	13,696,235	43,192,134	123,654,505	- 673,666	44,565,254	- 26,370,969	- 9,842,150	- 3,042,069	6,249,593	13,803,517	20,310,629	20,517,594
Air Quality/Environment (+ve indicates benefit, -ve indicates disbenefits)													
Health and environmental impact	101,052,098	-	-	13,511,540	12,587,566	11,710,632	10,878,613	10,089,474	9,504,346	8,890,654	8,357,665	7,934,726	7,586,884
Health and social impact	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon reduction	81,631,490	-	-	8,983,831	8,796,636	8,611,027	8,427,139	8,245,093	8,065,000	7,887,029	7,711,268	7,537,794	7,366,674
Active travel	18,092,642	-	-	2,101,917	2,030,838	1,962,162	1,895,809	1,831,699	1,769,758	1,709,911	1,652,088	1,596,220	1,542,242
Sub-total	200,776,230	-	-	24,597,287	23,415,039	22,283,821	21,201,560	20,166,266	19,339,103	18,487,594	17,721,021	17,068,740	16,495,799
Present Value of Benefits (PVB)	110,397,319	13,696,235	43,192,134	99,057,218	22,741,373	22,281,433	5,169,409	10,324,116	16,297,034	24,737,188	31,524,538	37,379,369	37,013,393
Implementation cost (+ve cost, -ve saving)													
Implementation cost	270,157,234	33,219,263	147,466,171	51,129,180	33,469,654	1,203,387	1,001,087	884,400	814,046	780,042	190,004	-	-
Sub-total	270,157,234	33,219,263	147,466,171	51,129,180	33,469,654	1,203,387	1,001,087	884,400	814,046	780,042	190,004	-	-
Operating & Maintenance cost (+ve cost, -ve saving)													
Operating & Maintenance cost	148,364,452	954,354	1,089,426	21,769,569	21,537,622	21,487,639	19,127,071	16,895,160	15,611,081	14,182,433	12,899,562	2,810,533	-
Sub-total	148,364,452	954,354	1,089,426	21,769,569	21,537,622	21,487,639	19,127,071	16,895,160	15,611,081	14,182,433	12,899,562	2,810,533	-
Revenue to the Public Sector (+ve cost, -ve saving)													
Clean Air Zone	- 233,978,982	-	-	49,009,556	37,908,849	51,380,577	36,773,504	23,608,700	18,348,348	11,339,707	5,609,740	-	-
Sub-total	- 233,978,982	-	-	49,009,556	37,908,849	51,380,577	36,773,504	23,608,700	18,348,348	11,339,707	5,609,740	-	-
Present Value of Costs (PVC)	184,542,704	34,173,617	148,555,598	23,889,193	17,098,427	28,689,552	16,645,346	5,829,141	1,923,220	3,622,768	7,479,825	2,810,533	-
Net Present Value (NPV)	- 74,145,385	- 20,477,383	- 105,363,463	- 122,946,411	5,642,946	6,408,118	11,475,937	16,153,256	18,220,254	21,114,420	24,044,712	34,568,836	37,013,393

Analysis of Monetised Costs and Benefits - 2021-2030	Total	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Transport Users Impacts	- 90,378,911	13,696,235	43,192,134	123,654,505	- 673,666	44,565,254	- 26,370,969	- 9,842,150	- 3,042,069	6,249,593	13,803,517	20,310,629	20,517,594
Health and Environmental Impact	200,776,230	-	-	24,597,287	23,415,039	22,283,821	21,201,560	20,166,266	19,339,103	18,487,594	17,721,021	17,068,740	16,495,799
Present Value of Benefits (PVB)	110,397,319	13,696,235	43,192,134	99,057,218	22,741,373	22,281,433	5,169,409	10,324,116	16,297,034	24,737,188	31,524,538	37,379,369	37,013,393
Implementation Cost	270,157,234	33,219,263	147,466,171	51,129,180	33,469,654	1,203,387	1,001,087	884,400	814,046	780,042	190,004	-	-
O&M Cost	148,364,452	954,354	1,089,426	21,769,569	21,537,622	21,487,639	19,127,071	16,895,160	15,611,081	14,182,433	12,899,562	2,810,533	-
Revenue	- 233,978,982	-	-	49,009,556	37,908,849	51,380,577	36,773,504	23,608,700	18,348,348	11,339,707	5,609,740	-	-
Present Value of Costs (PVC)	184,542,704	34,173,617	148,555,598	23,889,193	17,098,427	28,689,552	16,645,346	5,829,141	1,923,220	3,622,768	7,479,825	2,810,533	-
Net Present Value	- 74,145,385	- 20,477,383	- 105,363,463	- 122,946,411	5,642,946	6,408,118	11,475,937	16,153,256	18,220,254	21,114,420	24,044,712	34,568,836	37,013,393

£m		1000000
Version 1		
Discounted		
Economic Impact	£	£m
Reduction in NO2	52,331,683	52
Reduction in PM	48,720,415	49
Reduction in GHG Emissions	81,631,490	82
Health Benefits of Active Travel	18,092,642	18
Congestion Effect	209,727,698	210
Financial Impact of Upgrade	- 10,159,513	- 10
Welfare Loss (Trips Remoded)	- 16,774,791	- 17
Welfare Loss (Trips Cancelled)	- 39,193,323	- 39
Implementation Cost	- 270,157,234	- 270
Operating & Maintenance Cost	- 148,364,452	- 148

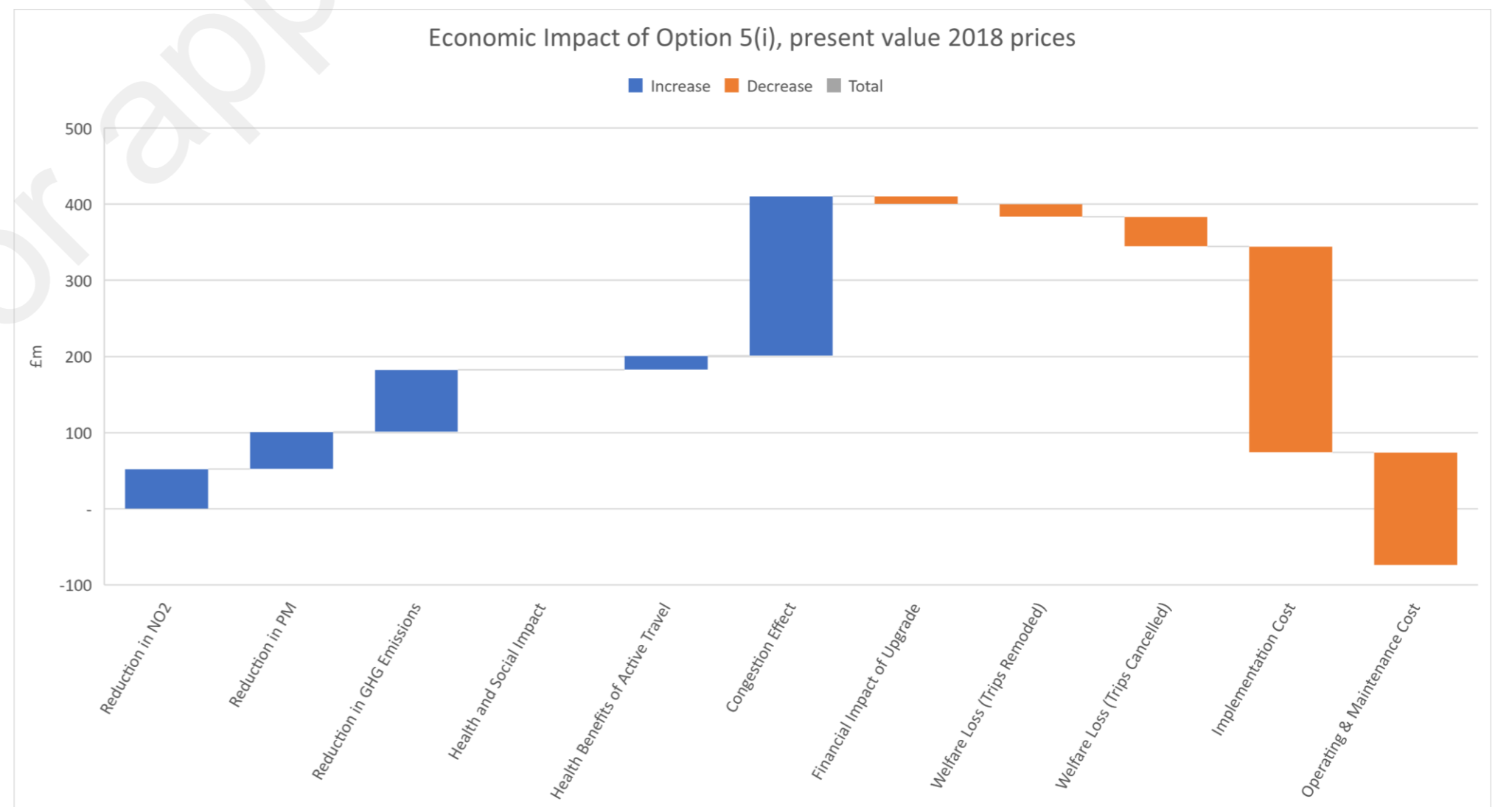


Version 2		
Discounted		
Economic Impact	£	£m
Reduction in NO2	52,331,683	52
Reduction in PM	48,720,415	49
Reduction in GHG Emissions	81,631,490	82
Health and Social Impact		
Health Benefits of Active Travel	18,092,642	18
Congestion Effect	209,727,698	210
Financial Impact of Upgrade	- 10,159,513	- 10
Welfare Loss (Trips Remoded)	- 16,774,791	- 17
Welfare Loss (Trips Cancelled)	- 39,193,323	- 39
Implementation Cost	- 270,157,234	- 270
Operating & Maintenance Cost	- 148,364,452	- 148

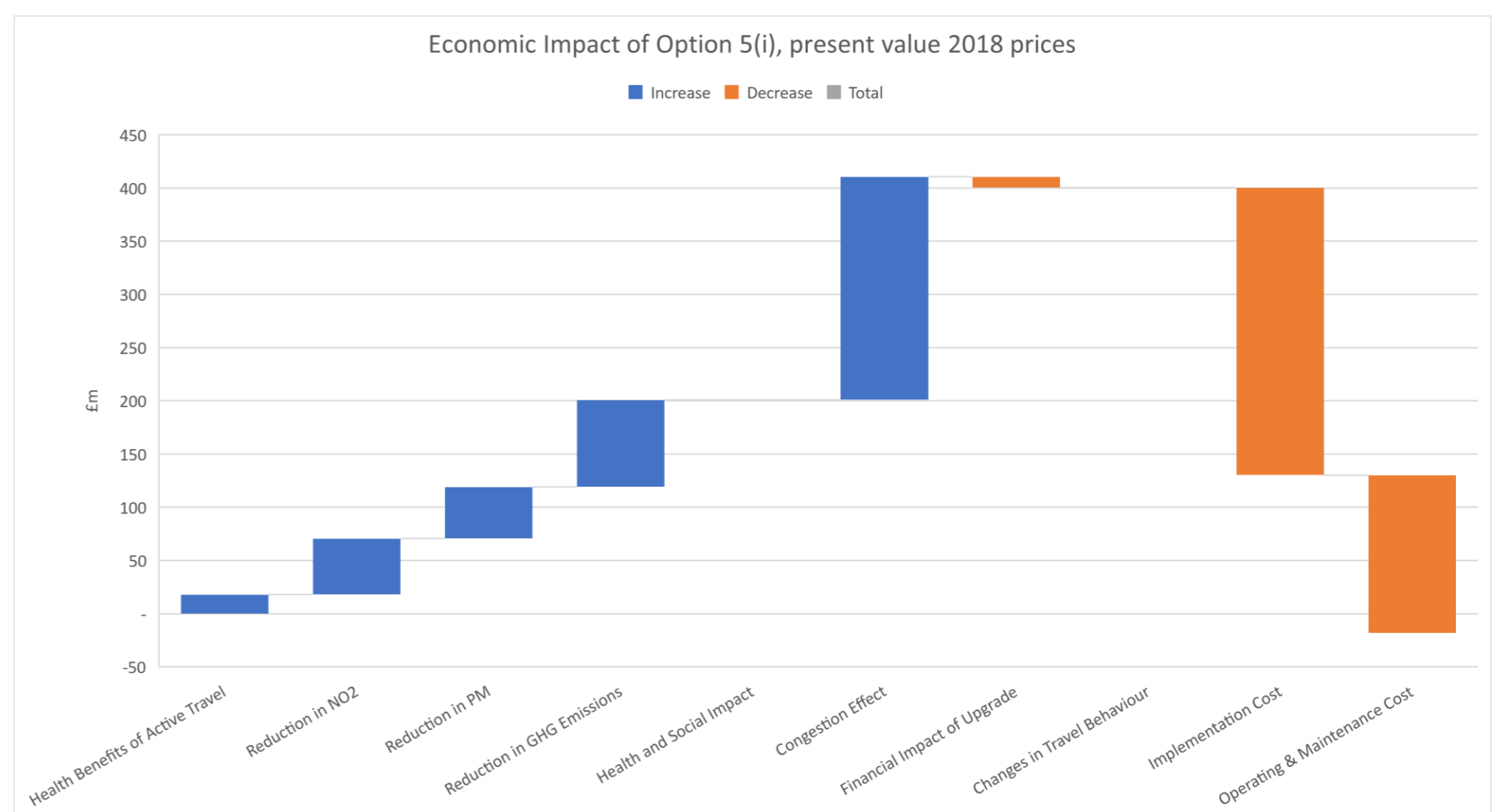


Version 3 - without revenue

Discounted		
Economic Impact	£	£m
Reduction in NO2	52,331,683	52
Reduction in PM	48,720,415	49
Reduction in GHG Emissions	81,631,490	82
Health and Social Impact		
Health Benefits of Active Travel	18,092,642	18
Congestion Effect	209,727,698	210
Financial Impact of Upgrade	- 10,159,513	- 10
Welfare Loss (Trips Remoded)	- 16,774,791	- 17
Welfare Loss (Trips Cancelled)	- 39,193,323	- 39
Implementation Cost	- 270,157,234	- 270
Operating & Maintenance Cost	- 148,364,452	- 148



Discounted		
Economic Impact	£	£m
Health Benefits of Active Travel	18,092,642	18
Reduction in NO2	52,331,683	52
Reduction in PM	48,720,415	49
Reduction in GHG Emissions	81,631,490	82
Health and Social Impact		
Congestion Effect	209,727,698	210
Financial Impact of Upgrade	- 10,159,513	- 10
Changes in Travel Behaviour		
Implementation Cost	- 270,157,234	- 270
Operating & Maintenance Cost	- 148,364,452	- 148



No. of Vehicles Upgrades

No. of Vehicles Upgrades	Cars	PHVs	Taxis	Vans	HGVs	Bus/Coaches*	Total
Option 8	-	1,965	2,127	32,277	6,962	2,221	45,553

Welfare Loss due to Cancelled Trips and Trips Re-modded, PV 2018 prices

Welfare Impact	Trips Re-modded	Trips Cancelled	Total
Option 8	17	39	56

Travel Time Savings and VOC

	Travel Time Savings	Vehicle Operating Costs	Total
Option 8	136	73	210

Health and Environmental Impact, PV 2018 prices

	NOx Tonnes Saved (2021)	PM Tonnes Saved (2021)	Monetised AQ Impact (2021)	Monetised AQ Impact (2021-2030)
Option 8	1,419	52	14	101

GHG Emissions, £, PV 2018 prices

Options	Tonnes CO ₂ e	GHG emission impact, £m
Option 8	1,398,819	82

Upgrade Impact, £m, PV 2018 prices

Options	Welfare Loss	Benefits from VRF	Fuel switch	Transaction cost	Loss of asset value	Total (by vehicle type)
Option 8	-	87	117	1	0	40

User Charges, £m, PV 2018 prices

	Option 8
User Charges, £m	-234

Implementation cost of the options, £m, present value 2018 prices

	Option 8
Total Implementation Cost	270

O&M costs of the options, £m, present value 2018 prices

	Option 8
Total O&M Cost	148

Active Travel Health Benefits, £m, present value 2018 prices

Health Benefits	£m
Option 8	18

Health and Social Care Cost Savings, present value 2018 prices

Options	£m
Option 8	0

Summary of the total costs and benefits of the GM CAP, £m, present value 2018 prices

Primary/Secondary Success Factors	Impact	Option 8
Health and Environmental Impacts		
• Reduction in NO2 Emissions	NO2 Reduction	52
• Strategic fit with local strategies and plans	PM Reduction	49
• Value for Money	Avoided Health and Social Cost	0
	GHG Emission Reduction	82
User Costs and Benefits		
• Strategic fit with local strategies and plans	Health Benefits of Active Travel	18
• Value for Money	Welfare Loss (Trips Remodded)	-17
	Welfare Loss (Trips Cancelled)	-39
	Vehicle Upgrade <i>includes cost of upgrade, loss of asset value, transaction cost and fuel switch costs, less any financial subsidy from the funding measures</i>	-10
	User Charges	
	Congestion Effects <i>Includes travel time and vehicle operating costs</i>	210
	Present Value of Benefits (PVB)	344
Cost to the Public Sector		
• Affordability	Implementation Cost	270
• Value for Money	Operating and Maintenance	148
	Revenue	
	Present Value of Costs (PVC)	419
	Net Present Value (NPV)	-74

This is the first mention of these options in the chapter – useful if they could be mentioned in the section around para 1.2.5

Summary of the total costs and benefits incurred by GM, present value 2018 prices

Impact	Option 8
NO2 Reduction	52
PM Reduction	49
Avoided Health and Social Cost	0
GHG Emission Reduction	82
Health Benefits of Active Travel	18
Congestion Effects <i>Includes travel time and vehicle operating costs</i>	210
Total beneficial effects	411
Changes in Travel Behaviour (welfare loss)	-17
Vehicle Upgrade <i>includes cost of upgrade, loss of asset value, transaction cost and fuel switch costs, less any financial subsidy from the funding measures</i>	-10
User Charges	0
Total costs / disbenefits	-27
Net Present Value (NPV)	£384

Nox savings per £

This worksheet presents the the abatement cost of every Nox tonne saved

	2021-2030
Total Nox Saved	11,274
Total Cost PV	£ 184,542,704
Nox/£	£ 16,369

draft for approval